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FOOD MANUFACTURE

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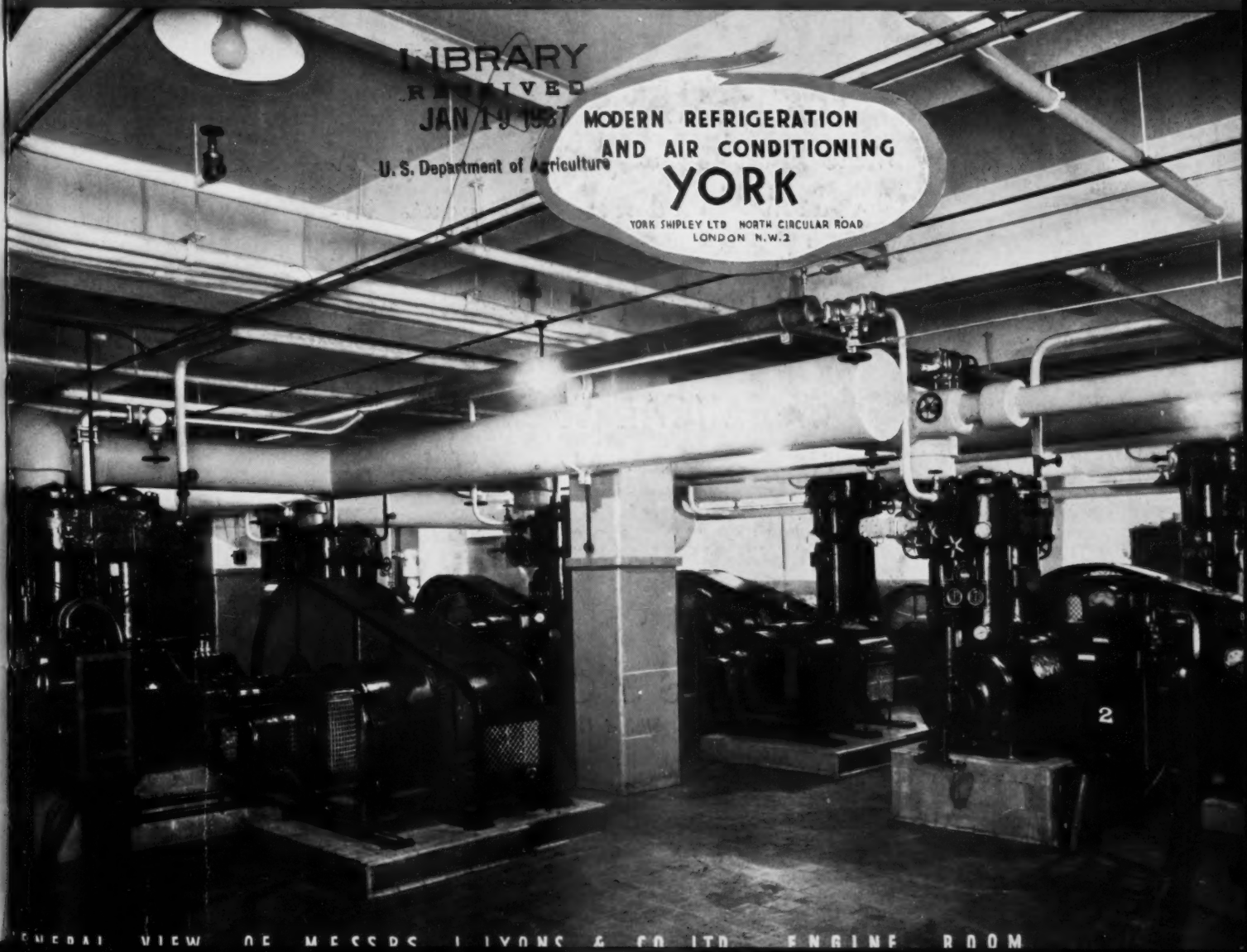

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FOOD MANUFACTURE

Incorporating Canning, Packing and Preserving.

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The Editor will be glad to consider contributions from those engaged in the Food Industry. Articles intended for publication should be of a practical nature and accompanied by photographs or drawings when possible

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MANAGING EDITOR: G. W. Lacey, B.Sc., A.I.C.

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FOOD MANUFACTURE

Vol. XI, No. 2 February, 1936

IN MEMORY OF A GREAT KING

"All dwellers in the dark and in the sun,
In the most populous, in the most lonely places,
Shall set a King among their 'old familiar faces'."

EDMUND BLUNDEN.
"An Elegy" in "The Times."

Dr. H. B. Cronshaw

IT IS with regret that we have to announce the decision of Dr. H. B. Cronshaw to relinquish the Editorship of FOOD MANUFACTURE in order to devote himself more exclusively to his consulting practice and advisory work in connection with industrial development. As most of our readers know, Dr. Cronshaw has edited this journal ever since it was founded, some nine years ago, and for that reason his decision to vacate the post will be all the more regretted. His address from February 1 will be 22a, College Hill, London, E.C. 4. Dr. Cronshaw's work will be carried on by Mr. G. W. Lacey, who has occupied the position of Managing Editor of FOOD MANUFACTURE and asssociate publications for the past year.

Dr. Lampitt

Dr. L. A. Lampitt gave us another of his inspiring food lectures on January 15, this time at the Royal Society of Arts. That Dr. Lampitt has a liking for the broad view, and also the long view, is not at all surprising when one casts an eye at the loftiness of his position from which he directs the operations of his scientific army, and when one gives an ear to accounts of his journeyings to distant lands—yet he could scarcely have chosen a more all-embracing, "astronomisch" title than "Food—and the World".

It requires courage and ample resources to fill out the generous proportions demanded, or at least expected, in an address which is not likely to fall short of justifying such a title. Dr. Lampitt, fortunately, has both these, and he employed them to good effect. He led his audience over a wide field, every detail of which was familiar to him, and he must have thoroughly enjoyed the excursion. There was no dallying over trivial matters; he pointed to this and that feature of interest and then hurried on to another point of vantage. It was indeed a worldwide survey of the science of food as it is to-day, and, as might be expected, brought out in their true perspective many matters which are engaging the attention of those whose business it is to study the broader aspects of food science, and it served to broaden the outlook of those whose attention was confined to specialised problems.

Food and the World

Much of his address was devoted to an examination of the conditions under which present-day research is carried out and the closer and more sympathetic relations which now exist between scientific workers and commercial organisations. A commercial firm does not depend—at least in the food industry—on the fundamental discoveries of its scientific staff, said Dr. Lampitt, but more on the application thereof to processes. The scientist will dictate the methods to be employed, but the acumen of the commercial managers will translate the results into £ s. d. Thus it may well be that science will eventually be the sole controlling influence in industry—assuming that this includes

the scientific method of approach to salesmanship, advertising, and so on.

Flavour

Dr. Lampitt quoted Beauvilliers' remark that it was not the job of the cook to please the eye, but the palate; not to fill one's leisure but one's belly pleasurably. When the chemist ventures to comment on flavours, he is leaving chemistry and becoming an individualist not backed by his professional training. Chemistry is one of the most exact of the sciences; cooking one of the least exact of the so-called "Arts". Even the recipe of the musician can be written down. The recipe of the chef is also written down, but no record of the result of his skill can yet be made. Our exact science is not sufficiently exact, neither is our knowledge deep enough.

Thousands of pounds have been spent all over the world in an endeavour to trace the source of the flavour of a particular tomato soup or of a particular chocolate. These Dr. Lampitt quoted as examples of fundamental commercial secrets, but they are certainly not examples of fundamental scientific truth. If Dr. Lampitt knew all there is to know of the fundamental truths underlying the transformation of an egg into an omelette, he could not make one; practice must be wedded to knowledge, and that is the tendency to-day.

Use of Food Scientists

Summarising the objects of the employment of scientists in the food industry, he said these were —to ensure a standard product, to produce a better article, to lessen costs of production. No startling economies are likely to be effected, and the return for money spent in investigational work will probably only repay its interest by reducing spoilage and controlling the standard of the product. In other words, investigation is not going to unlock any magic door of wealth in food industries, and the man who thinks it will had much better for his peace of mind close his laboratory and spend his money on advertising. As Lord Rutherford wrote: ". . . only those who habitually make use of science in the daily process of manufacture can turn advances in knowledge to their own advantage".

Food and the Consumer

As the present issue of the journal is meant to have a packaging bias it is not inappropriate to recall some of the remarks made by Dr. Monier-Williams, of the Ministry of Health, in the course of a lecture which he gave a few months ago to the Bristol members of the Institute of Chemistry.

The question which Dr. Monier-Williams asked was: "Does the chemist always succeed in producing a better article or does it sometimes only appear to be a better article, and has its real nature been skilfully camouflaged?" This is an important question—to the examination of which he devoted the main body of his lecture—for food is the one commodity the quality of which must, in the interests of the consumer, be most closely scrutinised and most rigidly controlled.

During the last sixty years public analysts have suppressed nearly all the abuses which were rife up to the middle of the last century. Most food manufacturers and distributors are anxious to avail themselves of the results of scientific research and to improve their methods, and food chemists have responded ably, as also have the engineers. At the same time, Dr. Monier-Williams believes that in some instances methods and processes have been, and are being, introduced which, although improvements from the vendor's point of view, are at least of doubtful benefit to the consumer, such as the bleaching of flour, the iodine treatment of fruit, the use of certain agricultural insecticides, the use of enamelled vessels for lemonade and acid drinks, and, likewise, aluminium for cooking vessels, the boiling of tomato purée in copper pans, the fumigation of food, the artificial colouring of food, the use of diacetyl and maleic acid, and so on.

Standards

These are some of the varied problems which arise when chemical research is applied to food, problems in which the interests of the manufacturer may clash with those of the consumer. It would, of course, be a relatively easy matter to fix arbitrary standards or limits, but before doing so we must be quite clear that such action is in the best interests of the consumer. There lies the difficulty, thinks Dr. Monier-Williams. There is usually no way of knowing whether these so-called improvements affect food adversely or not. Feeding experiments on animals furnish only rough indications, and with men it is notoriously difficult to ascribe any symptom to a particular cause, and to disentangle it from a multitude of other factors. It does not follow that because we cannot trace any bad effects to a particular food, no such effects are produced. The human stomach has wonderful adaptability, and can stand an enormous amount of ill-treatment. It may be that most of the things

mentioned above are trivial compared with the performances which many people demand of their digestions, and the atrocities which are often committed under the guise of cooking.

Soya

Some very interesting information about the cultivation of the soya bean is to be found in a little book by Bowdidge, called *The Soya Bean: Its History, Cultivation (in England) and Uses*, which has recently been published. For five thousand years and more the soya bean has been the staple food of the peoples of Eastern China and their protection from famine, but until recently it has not been possible to cultivate it successfully in England. Mr. Henry Ford in 1932 tried to raise a soya crop in Boreham, Essex, but before that the plant was cultivated by Mr. North in the Thames Valley after eighteen years' experiment. Mr. North went to Mr. Ford's assistance, and a quantity of his specially acclimatised seed was sown, from which good yields were harvested in 1933 and 1934. It has been found that poorer types of soil suit the bean better than rich ground, which weakens the plant's resistance to frost. The soya bean requires nitrifying bacteria, which are stated not to be present in English soil, but these can be introduced by inoculating the seed before sowing. One would have thought that land suitable for peas and beans or that on which clover had been grown would suit the soya bean. It is not necessary for us to enumerate the value of soya as a crop. It contains 46 per cent. protein and vitamins A, B, D and E, and it is stated that it would be the mainstay for feeding a country in time of war. Its flour is used for diabetic, infant, or breakfast food. Its oil can be used to make butter and lard substitutes or soap. As by-products we get cattle feed, enamels, varnishes, rubber substitutes, linoleum, inks, celluloid, and some parts of motor-cars. A most ubiquitous bean!

Too Many Bacon Factories

In a recent letter to *The Times* Lord Cranworth raised the question, " What should be our objective in regard to agriculture during the next five years?" So far the Government have pledged themselves to increase home production, and in order to further this end have created a number of Marketing Boards. Unfortunately things have not panned out as expected, and in many cases the Boards have been forced to restrict production instead of being the chief means of increasing home production. There has been a strange lack of a co-ordinated policy, and the subsidising of some branches of agriculture and the neglect of others has upset the balance of things. If any marketing scheme is to prove really successful it must apply to all the products concerned. In the case of milk, hops, and potatoes the Boards do embrace the whole of the several products, but under the pigs scheme only pigs for bacon are covered. The pigs scheme is further severely handicapped by the large number of bacon factories, and the Board may not reduce these until 1938. There are over 600 bacon curing centres in this country, whereas in Denmark, where far more pigs are handled, there are only 80 factories. These turn out a regular standardised product which has a ready sale in England. We have a large number of curing centres but very few really efficient factories. The matter is urgent, and as it is impossible to reduce the number of curing centres for two years the only alternative is to fix a standard of bacon (say, equal to Danish) and prohibit any bacon lower than this standard going on the market. By this means the inefficient curers would eliminate themselves.

Regional Food Research

We have chosen this rather unsatisfactory heading, for want of a better, to describe food research recently published in South Africa and India. The various activities of the League of Nations, to which we have made frequent reference, have shown that governments are realising their responsibility to provide their peoples food in sufficient amount and of the right quality. Human requirements cannot be regarded as fixed all the world over and may differ in different climates, and one has to take into consideration the food supplies naturally available in different geographical regions. All countries, therefore, should examine their own native foodstuffs in terms of the nutritional requirements of the people. What might be good in Tipperary might be useless in Timbuctoo. Quite a lot of work has been done in South Africa in this direction, and recently Levy and Fox have published their work on the antiscorbutic value of a number of South African foodstuffs. Lucerne has received special attention as its leaves were found to have a vitamin C content about four times that of fresh citrus fruit juice. It is used as a food for domestic animals — especially ostriches — but is there any reason why it should not be used for human consumption in the form of salad? Similar work done in Calcutta has shown that three fruits—zizyphus, physalis and citrus—are all more potent

sources of vitamin C than the Indian and African lemon and orange. Apart from their academic interest these researches are now taking on an international importance.

Grading of Milk

We note that in the *Medical Officer* of December 28 last year Mr. J. B. Howell emphasised the unreliability of grading milk according to the total bacterial count and the test for coliform organisms. He finds that if he sends identical samples to different laboratories for total bacterial count the reports are often quite different. It will be remembered that in our notes for January, 1935, we referred to a case of pasteurised milk in which the same milk was sent to two laboratories, one of which reported 9,270 bacteria per c.c. and the other 3,400,000! There are strong grounds for agreeing with Mr. Howell that little reliance can be placed upon a report of the bacterial content of milk when judging the grade or quality. Comparison of a series of counts made at frequent intervals certainly enables one to form a reasonable estimate of the standard of cleanliness under which the milk has been produced, but the results of a single test are almost worthless. There are two objections to the present method of grading milk. The first is the inherent inaccuracies of the total count, and the second is that, owing to the laboratory accommodation necessary and the high degree of technical skill required, a definite economic limit is set to the number of times an individual milk supply can be tested in the course of a year. What is required is not an elaboration of the technique of the total count, but the development of a test simple and cheap enough to be applied to an individual supply of milk daily. Perhaps Professor Wilson's expected report will throw some light on it; in the meantime Anderson and Meanwell's method (*Journal Dairy Research*, 1933, p. 213), in which attention is paid chiefly to the post pasteurisation count, is worthy of attention.

Mechanisation in Agriculture

Those responsible for the subject of Mechanisation in Agriculture at the Conference held at Oxford last month did a good service to British farming. The Conference attracted over 200 people, including many experts, but all keenly interested in the recent rapid development of agricultural methods. Such a conference, with the benefit of the experience of so many men who have devoted years to the study of agricultural problems, must go far to provide a rational outlook on the whole question of mechanisation. The term mechanisation does not mean merely the use of tractors and combine harvesters. Mechanisation really means a frame of mind, or a complete readiness to make use of modern resources, not in machinery alone, but in methods of organisation and costing systems such as are applied in ordinary industrial concerns. It means throwing off the old impeding garments of conservative farming and stepping out into the freedom of rationalisation. We do not need to fear that because farmers are adopting modern methods our farms and farming systems will disappear —what we should visualise as a result of modern tendencies is prosperity for farmers and commodities for consumers at prices within their reach. The recent conference has cleared the air somewhat and removed some of the mistaken notions about mechanisation and modern methods.

Good Bread

On another page we publish yet a further letter on the topic of Bread Consumption, from Mr. D. A. Ruffman, F.R.G.S., F.C.S., which supports what we said last month in connection with the letter from Sir Charles Higham. The real aim of the bakers should be to improve the quality of bread, in its value as a foodstuff and in its appeal to the palate, if the consumption of bread is to be increased to a substantial extent. Bread making is a craftsman's job, and in extending and improving mechanical means of production, the craft of good baking should be brought into service as much as possible. It must not be lost or left to survive in relative obscurity. Good bread, like good beer, is being made to-day, and nobody knows better than a brewer what would be the effect of depreciating essential qualities of beer to produce a cheaper, less palatable beverage on the grand scale. It would be the end of his brewery. But, then, bread is a necessity of life and beer is not. We recollect, from travelling in many parts of these islands, eating many different kinds of bread. In some parts it seems impossible to get away from the tasteless tin-loaf with a dark leathery crust. In our minds the word "crust" is associated with the word "crisp", and at least some crispness could be maintained by proper packaging and distribution. In other parts we have had as many as half a dozen different types of delightful bread offered in the most unpretentious hostelry. The millers and bakers must look after the quality of bread and couple improvement in this direction with their publicity campaign to increase consumption.

CEREAL CHEMISTRY in 1935

(The second and concluding part of the article in our January issue)

By T. H. FAIRBROTHER, M.Sc., F.I.C.

(Chief Chemist, McDougall's Limited)

Enzyme Action

The study of the enzymes of wheat and flour is most fertile and much work has been done on this difficult subject with, one fears, slender results. The first paper of the year on the subject, so far as the writer has been able to ascertain, was one by Swanson entitled "Some Factors which Affect the Diastatic Activity of Wheat". Interest in the diastatic activity of flour was stimulated in America by the low gassing rate of flour from the last few crops. The paper referred to contains a most admirable historical survey of the whole question of diastatic activity from the classic work of T. B. Wood in 1907 to the present time. Swanson has come to the conclusion that diastatic activity varies in different classes of wheat and is highest in durum wheats, followed by the spring wheats. Some white wheats were found to be comparatively high and others low. As a general rule, wheats grown under very dry conditions are lower in their activity than those grown under moist conditions. It is concluded that the diastatic enzymes in the endosperm probably exist in the form of proenzymes which may become activated by water, and the amount of such enzymes depends on conditions during kernel formation and ripening.

A further study on the same subject was contributed by Steller, Markley, and C. H. Bailey of Minnesota. This was a continuation of previous research and marked further progress. They found a limiting factor for enzymatic saccharification of starch, and this is apparently associated with the starch and can only be removed or inactivated by prolonged dialysis.

Experimental Methods

An important paper on the estimation of diastatic strength was published by Irvin in March. He pointed out that the usual methods for estimating diastatic activity are more or less unsatisfactory. He developed a simple and accurate method which has the advantage of employing a rapid volumetric procedure for determining the sugar formed from starch by enzyme action. The principle is, of course, not new, but the paper is valuable as intimate details are given that would enable even an inexperienced manipulator to carry out the method accurately.

Mangels and Martin have investigated the effect of different buffers and type of substrate on the diastasis of wheat starch. The differences found in sugar formation due to cooking the starch are so large as to indicate that results with cooked starch as substrate are of practically no value in predicting the activity of diastase on raw or natural starch.

In this connection mention should be made of the work of Geddes and Eva on a comparative study of the Blish and Sandstedt and a modified Rumsey procedure for the estimation of diastatic activity. This should be studied by anyone interested in the subject.

Catalase

Blish and Bode have devoted some attention to the little studied problem of catalase activity. Since the identification by Loew of catalase as an enzyme of general biological activity several investigators have undertaken experimental studies relative to catalase activity in wheat flour. These have shown invariably that in any sound, mature wheat kernel, catalase activity is highest in the branny outer portion and decreases progressively and very conspicuously toward the inner portion of the grain and is lowest in the central part of the endosperm. Its distribution is thus parallel to that of the mineral matter. This led several investigators to suggest the utility of catalase activity determinations for indicating flour grade. In the study now referred to a number of commercial flours were examined as to catalase activity with a view to obtaining conclusive evidence as to the potentialities of the catalase tests as an index of flour grade. The results indicated that the catalase test cannot be taken as a general index of grade, as the amount of catalase varies enormously with the district in which the wheat is grown. Moreover, the catalase activity is significantly reduced by commercial bleaching agents and by natural ageing at room temperatures, and it is affected by heavy grinding.

Nutritional Studies

Considerable attention has been devoted to nutritional subjects in the past year. These have embraced all types of foodstuffs and the cereal grains have received their share of attention. French and Mattill have contributed a paper on the biological value of the proteins of white, whole wheat, and rye breads. It was found that young rats did not utilise the protein of rye bread as well as that of milk supplemented white and whole wheat breads, but when determined on adult animals, whether human subjects or rats, the biological values of all the breads were of the same order. The conclusion was reached that the processes of manufacture have not significantly affected the nutritive value of breads, and the proteins of bread may be grouped in the same class as meat proteins and are inferior only to the proteins of the highest biological value such as are contained in milk or eggs.

Myers, Remp, and Bing have carried out investigations on hæmoglobin production in rats on diets containing

bread. They showed that some whole wheat breads contain twice as much iron and copper as white bread. Rye bread contains more copper and iron than white bread, but less iron than whole wheat bread. Feeding experiments showed that both the copper and iron of bread can be sufficiently utilised by anæmic rats for growth and production of hæmoglobin. An important study of the nutritional value of bread in the diet of human subjects and experimental animals was made by Eyerly, Oclassen, and Killain. Although bread has been an essential part of the human dietary for centuries, no comprehensive survey has been reported of the nutritional merits of bread as offered to the consumer by the baking industries. Since the realisation of the decline in the consumption of bread more attention has been paid to the problem both here and in America. In the latter country five laboratories are collaborating on an intensive study of various phases of the nutritional assets of bread as purchased on the market at four centres of the United States. The completed report will be most interesting. The work of Eyerly, Oclassen, and Killain is part of the general collaboration, and they have proved that bread produces effects on the subject's energy metabolism not shown by certain sugars. Bread not only exerted a greater specific dynamic action but also effected a more uniform distribution of heat production between carbohydrate and fat.

Vitamins and Baking

The opinion has frequently been expressed that the vitamins in bread are destroyed in the baking process. Attention has been devoted to one aspect of this (vitamin B [B_1]) during the year in the Laboratory of Household Science at California University. Morgan and Frederick state that practically no loss of vitamin B_1 occurs in whole wheat, rye, and white breads during the baking process. Variation in the oven temperatures from 350° to 450° F. had no constant effect on the vitamin B_1 content of bread. The crust of whole wheat bread is definitely lower in vitamin B_1 than the crumb, the maximum lowering being about 35 per cent.

In connection with the vitamin B (B_1, B_2 or G) content of wheat products, a further contribution from California University by Morgan and Hunt should be noted. They found that wheat germ separated from a given wheat sample contains six times as much vitamin B and four times as much vitamin G as whole wheat. A mixture of the whole wheat and 10 per cent. added germ contained nearly 50 per cent. more B than did the whole wheat. No doubt the wholemeal faddists will welcome this! If, however, all the flour milled was wholemeal, where would the extra 10 per cent. of wheat germ come from? Apparently fresh wheat germ contains three times as much G as eggs, five to six times as much as cow's milk, and about two-thirds as much as liver.

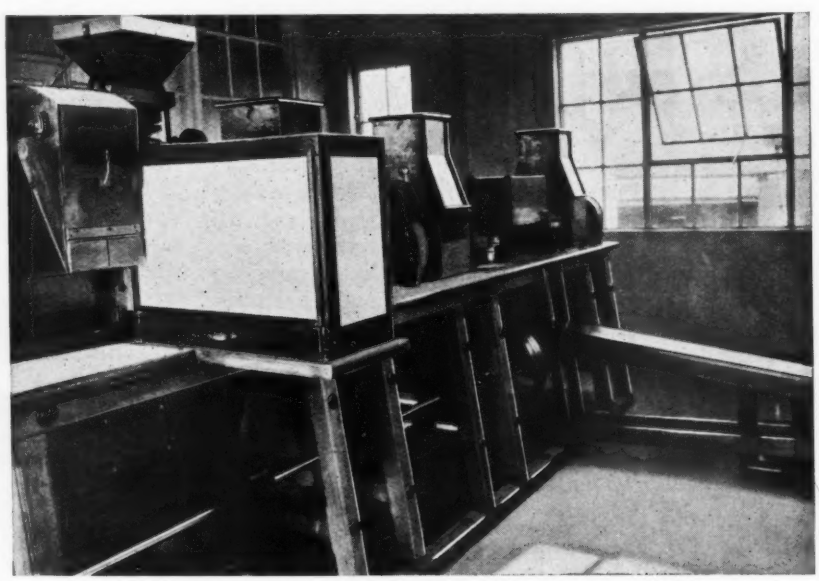
Much work is in progress on the subject of vitamins but the situation is still very vague and confusing.

Improvers

Reference was made at the beginning of this review to the use of physical methods of flour improvement. Nevertheless, interest is still maintained in the *modus operandi* of the chemical improvers. Some very interesting views have been expressed by Jørgensen on this subject. After lengthy experiments he has concluded that the hypothesis that the oxygen containing salts act as improvers because they stimulate carbon dioxide production must be given up. His final theory is that they act because they are able to inhibit the proteolytic enzymes of wheat flour so that the gas retention of the gluten films is increased. Many of his experiments seem convincing and his arguments plausible, but they do not explain the result of *over-treatment*. If inhibition of proteolysis is the only consideration, how can over-treatment become possible? Moreover, it does not show why these curious properties are demonstrated by potassium bromate and iodate and not by potassium chlorate. The question is by no means settled yet, and one still leans to the view expressed by Kent Jones, Neumann, and others that the effect must be of a colloidal chemical nature, since in colloidal chemistry we have examples of extraordinarily great physical changes being brought about by extremely small amounts of foreign substances. Potassium bromate has a marked effect on flour in such a low proportion as 1 part to 44,000 of flour. The action would appear to be catalytic rather than anything else.

Pests and Fumigation

Considerable work has been done on the heat control of insects. Japanese workers have found that the eggs of the angoumois grain moth are killed in five minutes



An experimental mill in a modern Flour Mill Laboratory.

at 60° C., but that the larvæ and pupæ are more resistant and require either a higher temperature or a longer exposure.

Experiments at Montana have shown that superheating mill premises for about twenty-four hours is an efficient method of fumigating, but all bags of flour and accumulations of cereals should first of all be removed. There are large unit heaters now available (in America) which are capable of bringing about the desired high temperatures at very reasonable cost.

Further work has been done on the use of ethylene oxide and carbon dioxide for fumigation. An interesting suggestion has been made of an air circulating plant consisting of a tubular system with a ventilator. It is claimed that by this means a 100 per cent. kill is obtained even in the densest grain layers. This should prove most valuable in dealing with silo infections.

The use of carbon dioxide in grain fumigation is receiving attention. The writer suggested the use of solid carbon dioxide in silos to inhibit weevil development some time ago. Recent work has shown that the toxicity of carbon dioxide at any given concentration is markedly increased by the addition of small quantities of methyl formate.

Analytical Methods

No review of this nature would be complete without some reference to new or improved analytical methods in the investigation of cereal products.

Munsey has described a method for the determination of chlorine in the fat of flour. The method given is virtually that described by Kent Jones and Herd in 1930, but one or two refinements are introduced, special attention being paid to the blank determinations. Interesting analytical details on the nature of the pigments of the gasoline extract of flour have been published by Markley and Bailey, as well as an investigation of the alcohol or acetone pigments. They detailed a method for the determination of the carotin pigment concentration in small samples of whole wheat. Baker, Parker, and Freese have continued their work on the measurement of colour in flour and bread by means of Maxwell discs. Irvin has described an improved apparatus for measuring gas production and expansion in doughs. It is a refinement of the apparatus previously described by Markley and Bailey. The American Association of Cereal Chemists has continued its practice of issuing reports of its various committees. These have embraced methods of testing self-raising flour, biscuit and cracker flour, and rye flour. A method for testing soft wheat flours by cake baking has been described and there has been published a general report on cake baking tests

Conclusion

It is obviously impossible to deal with all the points of a big subject in a short review such as this. All that has been attempted is a general indication of the trend of thought and research among those investigating the scientific problems of milling and baking. At the end of it one can confidently say that progress has been made, new conceptions have been formed, fresh hypotheses have been formulated. We know a little more about our subject than we did last year. We even know a lot of practical facts for which we have as yet no theoretical explanation. The fact that we do not know *why* a thing works is no reason why we should not use it. We don't know all about electricity but we have no hesitation in using it. Slowly and surely facts are being assembled, evidence produced and fresh discoveries made, so that we are getting nearer to a real understanding of the problems involved in the production of our daily bread.

Correspondence on Bread Consumption

THERE is an old Russian saying to the effect that "Paper suffers everything", and this would seem to be true as regards the quantity of paper now being used up in expressing opinions about the quality of bread. There are those who affirm in your January issue that nobody has any clear idea as to what exactly is meant by an attractive "bread flavour". There are others who maintain that there is no good bread here at all, and yet some other authorities are trying to make us believe that the consumption of bread has increased, nevertheless, since the beginning of the bread propaganda.

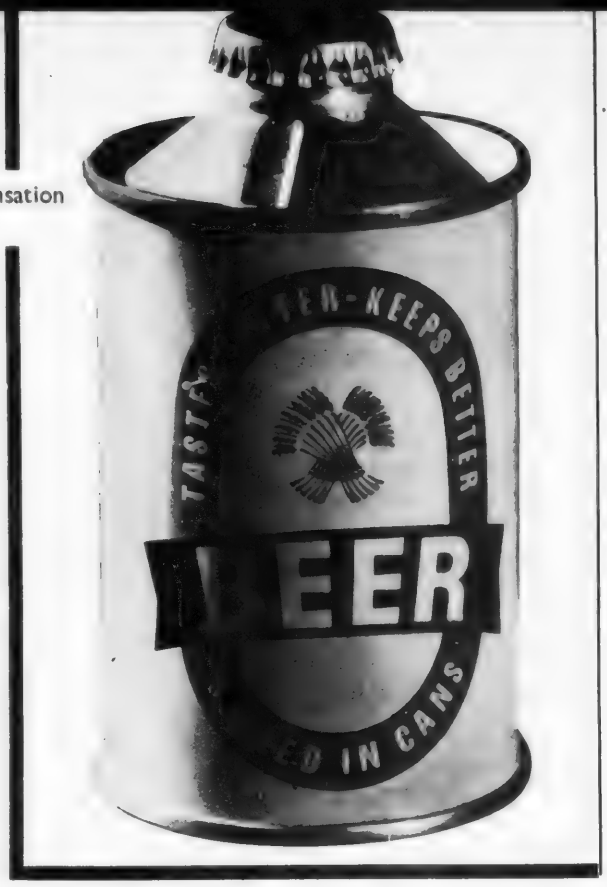
I think it is high time to show some disinterestedness in the whole matter, which should be tackled from the practical point of view. I maintain that there are only a few places in London where bread of fine flavour can be obtained, and these are: (1) Zeller supplies excellent white rolls, provided they are consumed the same day as baked; (2) the same can be said of Marchi's bread; (3) the Savoy, Claridge's, and Berkeley Hotels bake their own wonderful rolls; (4) the Great Eastern Railway Company serve a magnificent white roll at their own restaurant in Liverpool Street Station. This roll is baked on the premises and does not stand transport; (5) a wonderful milk-bread is baked by Soika, corner of Upper Marylebone and Hamsom Streets; (6) up to three or four years ago the Trocadero supplied an exquisite baton, but I have not been there since and do not know whether this is still the case; (7) Hovis brown bread is unsurpassed in flavour, provided the mixture is thoroughly worked and well baked. Unfortunately, not every baker adheres to these conditions, yet the owners of Hovis flour allow the bakers to call the bread "Hovis". (8) All these breads, however, are surpassed in quality by the bread baked from English stone-ground flour in the private household of Lady Redesdale. Without exaggeration, the flavour of this bread is exquisite. The secret lies not only in the quality of the flour, but also in the method of preparing the dough.

All the above breads are worthy of recommendation because they are of excellent flavour, but I leave it to you and your readers to judge whether it is right that such a large population as that of London should be confined to these few breads I have mentioned and the extremely limited sources of supply, considering that purchases can be made only from the firms mentioned—Nos. (1), (2), (5), and (7). Those who argue that there are many more places where fine quality bread can be obtained might, perhaps, like to compare their favourite makes with the above mentioned and then take the trouble to revise their opinions.

Instead of wasting so much paper over such a plain and simple question as that of "bread flavour", why not take those qualities mentioned above, compare them with any other, and thus establish a standard? True enough, *de gustibus non est disputandum*, but still, those who are fond of uncooked salt herrings, eaten straight from the barrel, may use this quotation till Doomsday before they will be able to persuade others that this briny "delicacy", and not unsalted fresh Astrakhan caviare, can be adopted as a standard for flavour.

Because bread is a necessity, it does not follow that bakers should exploit the public by giving us a tasteless, badly worked, and insufficiently baked article. If the above-mentioned firms and private people can produce excellent bread, it only proves that we can find the right quality flour on the London market, to which wheat from all over the world finds its way. Propaganda alone "to eat more bread" will not improve the quality, yet the latter might obviate the necessity of advertising.

D. A. RUFFMAN, F.R.G.S., F.C.S.,
Managing Director of Supex, Ltd.



Food Packaging made great progress in 1935, but the sensation of 1936 promises to be canned beer.

IN accordance with our established policy of inviting only well-known authorities to contribute on specialised subjects, the Editor of SHELF APPEAL here surveys for FOOD MANUFACTURE the progress of food packaging over the last twelve months.

FOOD MARCHES ON

BY JOHN M. RYAN
EDITOR: SHELF APPEAL

WHILE the cosmetic industry had far more new packages to its credit than the food industry during 1935, to the latter goes the distinction of having made use of infinitely more technical developments. Bearing in mind that the margin of profit available to the food manufacturer is substantially less than that of the beauty business, the number of interesting experiments and the general progress is a very happy sign. More food manufacturers redesigned their packs and products in 1935 than in any two previous years combined.

Confectionery to the Fore

As was only to be expected, the confectionery section contributed its fair share to the progress made. Rowntree's was an outstanding case as far as design is concerned. Starting with their now famous Floris at 6s. a lb., packed in the same gay wrapping it had in its native Hungary, which has carved out for itself a nice slice of the expensive chocolate eating market, they have carried their aggressive redesign policy to most of their cheaper lines—Chocolate Crisp and Cracknel Sandwich are two typical cases. They are distinctive in their economy of production, as most of them consist of clean lettering, and many are in one printing only. The craze for bars, inspired principally by the success of Mars, has developed into a fierce battle, which has resulted in some interesting transprinting jobs, such as Fry's Humpty and Milk Flake, Whitefield's Scrum and Nutz, and many others.

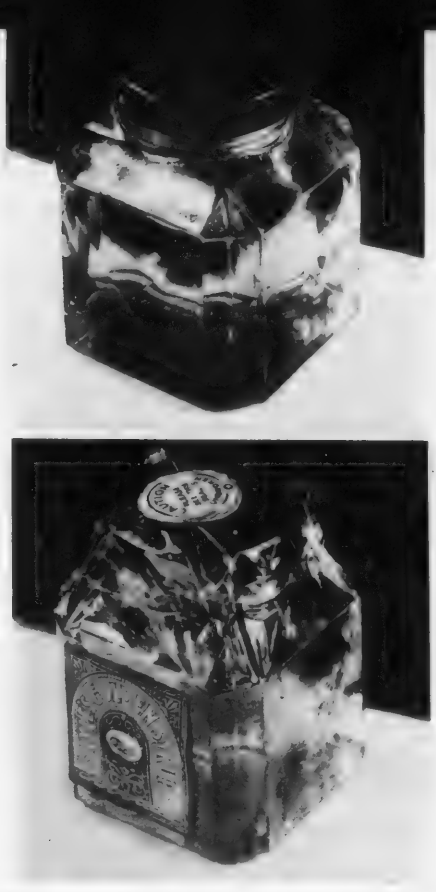
No world records were shattered by the biscuit trade, although quite a number of new labels have appeared. Few of these did more than exploit the commercial art technique of about 1932—freak lettering often staggering about at angles, confusing "abstract" and "modernistic" designs. The new wrappers for Harris's Bryanston Biscuits were probably the best that the biscuit industry put out this year.

Cakes in Cartons

Linked with biscuits is the cake world, in which the year's news was made by Stevens Bakeries, Ltd., with their simple one and two colour redesign of their cake boxes, which is gradually being extended to the complete range of sixty lines.

In the general grocery field there has been an almost astonishing advance. To begin with, Kraft, with one

Kappa Rice, in its smart red, white and black board canister and blue slip label, was an interesting marketing experiment on a product hitherto unbranded on a national scale.



Smart enough for perfume, yet containing syrup, Lyle's re-use container made packaging news in 1935.

sweep, redesigned every pack in what was previously one of the messiest ranges on the market from the design point of view. Judging by the display the new packs have deservedly received, this policy seems to have met with enormous success. In many ways it might be hailed as one of the most successful packaging jobs of the whole year. A fairly close runner-up was the new re-use container for Lyle's Golden Syrup. This smart glass jar, with its double shell metal closure, is one of the few instances of the grocery trade's exploitation of the re-use container which is so popular in America. Another bold experiment in a field in which few have ever risked innovation is that of Maconochie's new sauce bottles. These were actually designed by Reco Capey (of Yardley fame), and were given red plastic closures and simple red, black, and gold labels.

Rowntree packs (*above*), typical of the excellent, clean and economical design which scored such a success in the confectionery trade last year. Battenburg Square (*below*), from Stevens Bakeries, Ltd., attractively packed in either moisture-proof Cellophane or cartons of simple one and two colour designs.

Branded Rice

An interesting experiment was the marketing and branding of rice on a national scale by C. T. Bowring with their Kappa Rice. This was a very carefully planned job, and represented the first occasion of the use of the Paper Board Canister (see photo).

With the continuation of the "slimming" habit, both of the big suppliers of Crisp Bread strengthened their package appeal. Ry-Vita made the shape of their pack more convenient, while Vita-Wheat went two steps further. They not only packed their product in separate pieces, but incorporated a tearing device in the container's lid which made it easier to extract the contents. An interesting feature was the adoption of metal ends to protect the contents from crushing.

Another interesting constructional improvement was

that used in the Quaker Oats carton for Puffed Rice—a pouring device built into the side of the carton.

The way in which Eustace Miles rationalised and redesigned the containers for their entire range was noteworthy. The new trade mark was used on stationery, cheque book, and even on delivery vans.

In spite of the tea campaign, most tea packages continue to suffer from the "droops". That is why full credit should be handed to Kardomah for the very pleasant and appropriate designs, which the company fortunately had the foresight to extend to most of their other lines.

Nobody was surprised when the Jubilee failed to produce anything of more than passing interest. Most firms went bald-headed for blue and silver and embossed heads, although Lyons' tin for their Dundee Cake was easily the best—a job as well printed as it was well designed. Also worthy of note were Fuller's rather magnificent chocolate boxes covered in rough white paper with metal foil seals, and Callard and Bowser's special tins of sweets.

The Sensation in Beer

But at the tail-end of the year came what promises to be the sensation of 1936—beer in cans. While most people had heard of the headway made by canned beer in the U.S.A., they had not regarded it as a serious possibility in England. Only when it became known that as a result of a host of enquiries from brewers and makers of drinks of many kinds, the Metal Box Company were getting ready to test out thoroughly cans and linings for use in Great Britain, did the food industry sit up with a jolt, and it has not sat back yet.

Whatever public reaction to canned beer may be, the brewers seem convinced that it will be a boon to export business, and they will probably prefer the type of can illustrated at the beginning of this article, a style which has many of the advantages of the bottle and can be opened with a crown opener.

In common with most industries, the food industry has made profitable use of the selling power of Mickey Mouse. So far, Sharp's Toffee, Wright's Biscuits, and Grape Nuts have made use of him, Wright's with particularly powerful visual effect.

The paper milk bottle has continued to make progress so far as distribution is concerned, although the Satona milk carton, which seems to have solved most of the technical difficulties, has not been adopted very rapidly.

Waxed board has also been used for a surprising variety of products—herrings, glacé cherries, honey, biscuits, tomato paste, jam, and powders of various sorts —and the standard of printing upon it has improved considerably.

At the time of writing there is evidence that the experiments and results of 1935 will not be wasted. Packaging's now unquestioned selling value is spreading even to the oldest and most conservative firms, and the rate at which the redesign of old products is planned is a very hopeful sign. A further refreshing note is the way in which the services of the really trained package designer, as opposed to the dabbler, are being made use of.

Trends

Few British food manufacturers can afford to ignore the changes that have been taking place in food packaging and marketing in the U.S.A. during last year. In many ways, these changes were more spectacular than those in this country, and most of the outstanding innovations and trends will undoubtedly be copied by English manufacturers during the next eighteen months or so.

Some of the protagonists in the great bar battle. Note the transpaper wrappers, the queer, American names, and the standard of design which, on the whole, is quite good and straightforward. The Confectionery Exhibition of 1935 showed, for the first time, the tremendous effect the MARS bar has had on the trade.

Perhaps the most successful package redesign job of the year, judging by the display its bright new packs have received. Yet formerly the design of the Kraft Cheese range was as messy as any hundred-year-old product on the market.

An innovation in sauce bottles — wide necks, pleasant shape, and red moulded plastic screw caps.

This, anyway, has been the experience in the past. Outwardly, one of the least spectacular developments, but one which is nevertheless almost certain to sweep England as it has swept America, is the widespread adoption of nitro-cellulose lacquer for cartons.

Starting on beauty products, this has now spread to such items as biscuit cartons, flour cartons, and similar products. This gives the board a fine gloss and protects it against rubbing and discoloration. It also brightens and intensifies the colours and gives the whole job a better feel.

The repeal of prohibition saw terrific activity in the packaging of the host of new wines and spirits which were rushed on to the market in America. So far as the bottles were concerned there has been a distinct tendency to freakishness, which has made most of the bottles appear far more suitable—to English eyes, at least—for face lotions than for drink. From all this welter of activity, one interesting development has appeared—the very widespread use of cartons for bottles. Some of these have been printed in many colours on varying types of boards, some have imitated wood, and others, the most interesting from a display point of view, have used a cut-out window through which the glass of the bottle and the actual contents can be seen.

Another habit which will undoubtedly spread over this side is the use of re-use containers. Lyles have led the way (see photo), but in America such products as tea, cheese, and meat pastes and many other food lines have found it profitable to go to the expense of having a re-use container specially designed. Usually this is in the form of a glass or tumbler, sometimes ornamented with coloured lines. The seal used is generally a non-replaceable metal closure of the "tear-off" type.

Eustace Miles' redesign was based on the new M trademark and on a colour scheme of brown, black and yellow. In the redesign process, the number of lines was reduced from forty to nine, which made possible a great rationalisation in the types of containers used.

ALUMINIUM FOIL in the FOOD INDUSTRY

By F. H. Vince

THE TERM "foil" is one of those vague classifications for which there do not appear to be any clearly defined limits. This is possibly due to the fact that only in comparatively recent years has it been possible to roll aluminium commercially down to the present limits of thickness, which lie in the neighbourhood of from ·005 mm. to ·006 mm. Where material ceases to be foil and falls under the classification of leaf is not clearly known, nor is there very much greater clearness as to the exact boundary between sheet and foil.

For the purpose of declaring under Customs in this country, it was decided by the Board of Trade to state "foil" as being ·006 in. and thinner gauges, the thicker gauges being classified as sheet or strip.

The initial developments of foil production were mainly due to its use in the tea industry, and the increasing demand for the thin aluminium foil for packeting purposes tempted pioneers further in the direction of rolling down commercially to the thin gauges attainable in other metals. The adoption of aluminium foil in preference to tin foil is due to two factors greatly in its favour; it is much lighter, and, in contrast to tin foil, its price is low and stable. Now that aluminium foil has reached its present standard and that pinholes have been eliminated, there is little wonder that it has displaced the heavier metal, which is also three times as expensive.

Different Metal Foils

There is not much difference between tin and aluminium foil from the point of view of properties. Aluminium forms a very satisfactory substitute for tin for most applications of foil, and is even considered by some experts to be superior to it, being less toxic and more hygienically fabricated by thorough annealing and removal of all rolling oil traces.

With regard to the other type of foil, that made of lead, the chief application of such foil is in the wrapping of products to be sold in small units. But for foodstuffs the very nature of lead foil rules it out in most cases and its use would constitute an infringement of the law. Further, its great weight generally renders its employment economically impractical. There are some specialised purposes, however, for which it is used, such as for tea chest linings and packages. Even here, however, aluminium foil has proved satisfactory following tests carried out some years ago. A Government examination showed that aluminium foil is approximately three times stronger than lead foil, in addition to weighing only about one-fifth as much.

It is interesting to note that as a lining for tea chests, foil made of aluminium does appear to keep out dampness and dust better than lead foil. For purposes of comparison, a tea firm has packed quarter-pounds of tea in lead and aluminium packages. Samples were tried after one and two years, and the aluminium-packed tea was found to be quite fresh and drinkable, whereas the lead-packed tea was completely deteriorated. In addition to this important hygienic advantage, aluminium foil linings are cheaper and have a higher scrap value.

Aluminium foil is in every way suitable for automatic packing, which can be effected in the same plant as that used for tin foil, for example, although some slight adjustments are necessary. The principal drawback of

The aluminium-capped milk bottles illustrated at the top of the page are by United Dairies Ltd. The caps can be removed by a slight twist and easily replaced.

COMPARATIVE WEIGHTS OF FOILS.

Thickness of Foil.		*Surface covered by 1 lb. of* ALUMINIUM.		*Surface covered by 1 lb. of* TIN.		*Surface covered by 1 lb. of* LEAD.	
Mm.	*Inches.*	*Square metres.*	*Square inches.*	*Square metres.*	*Square inches.*	*Square metres.*	*Square inches.*
0·006	·00024	27·94	43,260	10·38	16,080	6·64	10,300
0·007	·00028	23·94	37,120	8·90	13,780	5·70	8,830
0·008	·00031	20·96	32,460	7·78	12,060	4·98	7,720
0·009	·00035	18·62	28,870	6·92	10,720	4·43	6,880
0·010	·00039	16·77	25,990	6·22	9,647	3·99	6,186
0·011	·00043	15·23	23,610	5·66	8,760	3·62	5,620
0·012	·00047	13·97	21,630	5·19	8,040	3·32	5,150
0·013	·00051	12·89	19,980	4·79	7,420	3·07	4,760
0·014	·00055	11·97	18,560	4·45	6,890	2·85	4,415
0·015	·00059	11·18	17,310	4·15	6,430	2·66	4,120
0·016	·00063	10·48	16,230	3·89	6,030	2·49	3,860
0·017	·00067	9·86	15,290	3·66	5,670	2·35	3,640
0·018	·00070	9·31	14,420	3·46	5,350	2·22	3,440
0·019	·00075	8·82	13,680	3·28	5,075	2·10	3,258
0·020	·00079	8·38	12,990	3·11	4,823	1·99	3,090
0·022	·00087	7·62	11,810	2·83	4,385	1·81	2,810
0·024	·00094	6·98	10,820	2·59	4,015	1·66	2,580
0·026	·00102	6·44	9,995	2·39	3,710	1·53	2,380
0·028	·00110	5·98	9,280	2·22	3,445	1·42	2,210
0·030	·00118	5·58	8,660	2·08	3,215	1·33	2,060
0·032	·00126	5·24	8,120	1·94	3,015	1·25	1,932
0·034	·00134	4·93	7,640	1·83	2,835	1·17	1,819
0·036	·00142	4·65	7,220	1·73	2,680	1·11	1,719
0·038	·00150	4·41	6,840	1·64	2,540	1·05	1,629
0·040	·00157	4·19	6,500	1·56	2,412	1·00	1,547
0·045	·00177	3·72	5,770	1·38	2,141	·89	1,373
0·050	·00197	3·35	5,200	1·24	1,930	·80	1,238
0·055	·00217	3·04	4,720	1·13	1,753	·73	1,123
0·060	·00236	2·79	4,330	1·04	1,608	·67	1,031
0·070	·00276	2·40	3,715	0·89	1,378	·57	884
0·080	·00315	2·10	3,250	0·78	1,206	·50	773
0·090	·00354	1·86	2,887	0·69	1,072	·44	688
0·100	·00394	1·68	2,599	0·62	965	·40	619
0·125	·00492	1·34	2,076	0·49	761	·32	494
0·150	·00591	1·12	1,731	0·42	643	·27	412

aluminium foil in comparison with other foils has been the practical impossibility of making soldered joints, but recent experiments show that it is possible to solder aluminium foil down to as thin a gauge as ·008 mm. There are, of course, other methods of obtaining a fairly efficient seal when packing material with foil, but there is no doubt that when it is possible to solder aluminium foil commercially, additional outlets will become available.

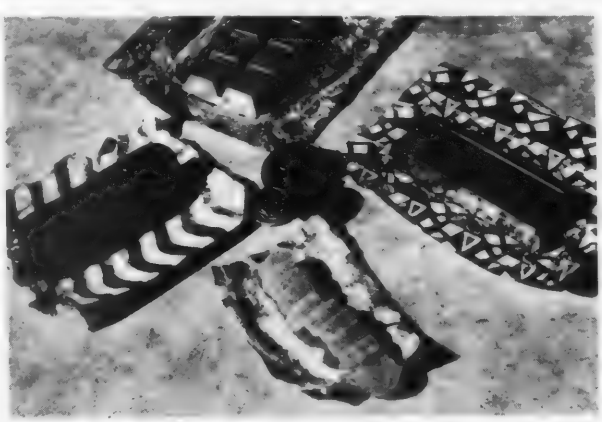
Thousands of tons of aluminium are used annually for packing purposes, chiefly in the forms of foil wrappers and small containers of various kinds for foodstuffs. To the packer of edibles, pharmaceutical products or other delicate preparations, the universal use of aluminium utensils is significant. In addition, it is non-toxic and tasteless, and does not set up any "metallic odour", and it may safely be used in direct contact with foodstuffs without contamination. The covering area of a pound of aluminium, tin and lead foils is given in the table opposite, and since there is such a difference in covering area, the pound price should not be taken as a basis of consideration, but rather the price per unit of covering area.

Applications of Aluminium Foil

Aluminium foils may be used without any backing or with a backing of paper, waxed to the foil or gummed to the foil. Both backed and unbacked foil can be used for hand packaging and in connection with automatic packing; the use of unbacked foil for hand packaging is, however, limited and largely depends upon the size and shape of the commodity being wrapped. The foils may be used with plain, embossed, lacquered or printed designs without any difficulty.

Among the largest consumers at present is the confectionery industry, though the consumption in this industry may yet be considerably extended. Apart from this, there are excellent opportunities for the use of foil for wrapping other food products. The wrapping of cheese in aluminium foil is not, for example, an accomplished fact.

Aluminium foil as now produced meets the needs of users for practically every type of pre-packed goods, and the foil manufacturers are always willing to assist potential users in selecting the most suitable foil or foil and paper combination to suit particular requirements. The usual thickness of aluminium foil for such packaging is ·009 mm. (·00035 in.) in soft temper when it is susceptible to decoration and has wide adaptability to design and finish.



Chocolate and confectionery packs employing aluminium foil of different colours with printed and impressed designs. On the market today there is a wide range of aluminium foil for packing purposes with a variety of attractive designs.

The latest development in aluminium foil packaging—a miscellaneous assortment of aluminium foil paper bags with dull or shiny surfaces, coloured or plain. They are greaseproof and moisture-proof and can be used again at home.

Chocolates wrapped in fancy aluminium foil brighten up any chocolate box and make the contents look even more appetising.

Coloured Foils

Colours in practically any desired shade can be obtained, having a transparent effect with the sheen of aluminium showing through the colour, or with an opaque lacquer, giving a more subdued effect. For small individual packets such as chocolate bars it is unnecessary to back the foil with paper, as the thickness of ·009 mm. is found to be strong enough for machine wrapping. The paper-backed foils are usually adopted for larger packets, and the paper gives additional strength and substance to the foil to form a completely airtight wrapper or package, the aluminium foil itself being already impervious to light and moisture.

The Latest Development

A very recent project in aluminium foil packaging has been the introduction by a large aluminium manufacturer in this country of an aluminium foil bag which consists of plain or embossed foil of a thickness about ·010 mm. attached to greaseproof or other type of paper. The aluminium bag can, of course, be printed upon in one, two or three colours without difficulty, and as the colours take so well on the bright metal surface, quite an attractive package can be made up, considerably adding to the sales-appeal of the product. The usual sizes and shapes of bags can be supplied, and without doubt this innovation will appeal to packers of tea, coffee, dried fruits, nuts, confectionery, groceries, and similar bulk edibles. The well-known protective qualities of the aluminium foil are retained in the foil bag and the contents are kept free from the damaging ultra-violet rays which cause rancidity. The penetration of moisture is also effectually barred, so keeping the product fresh and in the condition as at first put on the market.

With regard to the heavier type of aluminium foil ranging from about ·001 in. up to ·006 in., in addition to the lining of chests for tea and desiccated cocoanut, the foil is used extensively to make up small containers and for bottle caps. During the last four or five years quite a considerable amount of experimental work was done to make an aluminium milk bottle capsule which would compete in price with the cardboard disc insert. This has now been accomplished, and one large dairy concern in this country has decided to adopt aluminium capsules entirely for the capping of their milk bottles. The shape of the bottle differs slightly from that with the cardboard disc, and the cap completely covers the pouring lip of the bottle, practically hermetically sealing the contents. The cap is very easily removed by twisting round and does not require prying or puncturing. On taking off the cap from the milk bottle, the milk is poured out absolutely free from dirt and germs which may have accumulated in transit and handling after leaving the dairy.

Erratum

THE automatic refrigerating plant supplied by Randall's Refrigeration Limited to the Swan Food Products Limited, and illustrated on page 8 of our January issue, contains two ammonia compressors of 25 h.p. and 12½ h.p. and embodies the latest flooded system coolers with float control.

A slight error occurred in the quotation of h.p. in the caption on page 8.

ADDENDUM

The B.I.F., 1936

EXHIBITS AT OLYMPIA—*General Section*	*Stand No.*
Aerofilms, Ltd.	C 415A
British New Wrap Co., Ltd.	G 926
Eburite Corrugated Containers, Ltd. ...	G 928A
Guelph Cask, Veneer and Plywood Co., Ltd.	G 929
W. Lusty and Sons, Ltd.	G 914
Medway Corrugated Paper Co., Ltd. ...	G 911
Packers Supply Co., Ltd.	G 922
Transparent Paper, Ltd.	G 911A

THE B.I.F., 1936

General Information for our Readers

THE British Industries Fair, 1936, which is being held at Olympia and the White City, London, and at Castle Bromwich, Birmingham, from February 17 to 28, will be a record-breaking Fair. The experiment of holding the Birmingham Section of the Fair later in the year in May has not been continued. Once more there is an increase in the area covered by the actual exhibits. Sixty-four countries in all will be represented.

Travel Facilities

Special travel facilities are available for all visitors. For those coming from abroad, eleven air lines are giving a rebate of 10 per cent. on single or return tickets, and there are other reductions for sea and rail travel. Full information with regard to the various concessions and the necessary tickets at reduced rates may be obtained from any Continental office of Messrs. Thos. Cook and Son, Ltd./Wagon-Lits, and the other chief travel agencies in Europe. Visitors from the United Kingdom can obtain special "Monthly Return Tickets" or "Circular Tour Tickets" on application at the railway offices, but special vouchers are needed by visitors from Northern Ireland and the Irish Free State, and those from the Channel Islands will be asked to produce an invitation card to the Fair. Further information can be obtained from the British Industries Fair, Department of Overseas Trade, 35, Old Queen Street, London, S.W. 1.

Times of Admission

The London Fair will be open to trade buyers from 9.30 a.m. to 7.30 p.m. daily, admission being by the Trade Buyers' Badge, which is obtainable for the price of 2s. at the entrance, on presentation of the department's card of admission or the buyers' business card. The public will be admitted daily on payment, from 4.30 p.m. to 7.30 p.m., except on Saturday, February 22, and Friday, February 28, when they will be admitted throughout the day. On Sunday, February 23, the Fair will not be open.

The Birmingham Fair will be open daily from 10 a.m. to 6.30 p.m., and it will also be open during these hours to the public, on payment.

LONDON SECTION

The following exhibits will be found on the ground and first floors at Olympia: Food extracts and essences, invalid and infant food, foodstuffs, beverages, produce, etc.; paper, printing and stationery; pottery and glassware; optical, photographic, scientific, chemical, and druggist sundries. The stand of Leonard Hill Limited, the publishers of FOOD MANUFACTURE and other trade periodicals, is also situated on the ground floor in the Chemical Section, near the stand of A. Boake, Roberts and Co., Ltd., W. J. Bush and Co., Ltd., Monsanto Chemicals, Ltd., manufacturers of coal-tar products; Stafford Allen and Sons, Ltd., manufacturers of pharmaceutical preparations; Whiffen and Sons, Ltd., manufacturers of aniline dyestuffs; and Imperial Chemical Industries, Ltd. There is nothing of interest to our readers at the White City.

EXHIBITS AT OLYMPIA

The Paper, Printing and Stationery Section:	*Stand No.*
Cellulose Wadding Supplies, Ltd. ...	B 379 & 391
Corrugated Packing Materials Co., Ltd. ...	B 379 & 391
John Dickinson and Co., Ltd.	B 340 & 368

The Paper, Printing and Stationery Section (continued):	*Stand No.*
Freeder Bros. Paper Mills	B 395
Freeder Crepe Paper Mills, Ltd.	A 40 & 90
Andrew Levy and Co., Ltd.	B 362 & 380
Livermore and Knight, Ltd.	B 319
P. P. Payne and Sons, Ltd.	B 338
Arthur Sanderson and Sons, Ltd.	A 41 & 89
Wiggins, Teape and Alex. Pirie (Sales), Ltd.	B 347 & 358
Allied Paper Merchants (W. T. and Co.), Ltd.	B 347 & 358

The Pottery and Glassware Section:	*Stand No.*
Doulton and Co., Ltd.	C 432 & 439
Fulham Pottery and Cheavin Filter Co., Ltd.	A 190
Jackson Bros. (of Knottingley), Ltd. ...	C 454A

The Optical, Photographic and Scientific Section:	*Stand No.*
Oertling L., Ltd.	A 130, 131 138, 139
Bellingham and Stanley, Ltd.	A 52
Hanovia, Ltd.	A 116
The Tintometer, Ltd.	A 79

The Chemical Section:	*Stand No.*
A. Boake, Roberts and Co., Ltd.	A 156
W. J. Bush and Co., Ltd.	A 158
Monsanto Chemicals, Ltd.	A 160
Stafford Allen and Sons, Ltd.	A 176
Whiffen and Sons, Ltd.	A 181
Williams (Hounslow), Ltd.	A 177
Imperial Chemical Industries, Ltd. ...	A 157 & 161

The Druggist Sundries Section:	*Stand No.*
Consol Products, Ltd.	E 676
Corfield-Sigg, Ltd.	E 652
Viscose Development Co., Ltd.	E 662
The British Rototherm Co., Ltd.	E 652

The Foodstuffs Section:	*Stand No.*
Carbutt and Co. (1928), Ltd.	G 908
Chocolate Products Co., Ltd.	G 909
Culpitt G. T. and Son, Ltd.	G 909A
Overtons Chocolates, Ltd.	G 906
Sozol (1924), Ltd.	G 905

BIRMINGHAM SECTION

All machinery of interest to the food manufacturer is housed at Castle Bromwich, Birmingham, in the one building, except in the case of large working models, which are outside in the grounds. The machinery is grouped under the following divisions: A Stand numbers contain Hardware exhibits; B, Building exhibits; C*a*, Gas exhibits; C*b*, Electricity exhibits, and D, Engineering exhibits.

There is a good service of trains between London and Birmingham, and adequate facilities for travelling to and from Castle Bromwich, so that visitors will find no difficulty in attending both branches of the exhibition. There is an aerodrome adjacent to the ground at Castle Bromwich for those who favour the most advanced mode of travelling.

Exhibits at Birmingham

The Hardware, Ironmongery and Brass-foundry Section:

	Stand No.
Barrett and Elers, Ltd.	A 303
John J. Blow	A 308
British Emulsifiers, Ltd.	A 717
Bulpitt and Sons, Ltd.	A 517
W. P. Butterfield, Ltd.	A 601
Arthur Holden and Sons, Ltd.	A 524
Lee and Wilkes, Ltd.	A 521
London Aluminium Co., Ltd.	A 511 & 410
Midland Fan Co., Ltd.	A 722
Midland Metal Spinning Co., Ltd.	A 611 & 510
Mirrlees Bickerton and Day, Ltd.	A 434
Mirrlees Watson and Co., Ltd.	A 434
George Salter and Co., Ltd.	A 507 & 406
Sellman and Hill, Ltd.	A 407 & 302
G. H. Williamson and Sons, Ltd.	A 408

The Building Section:

	Stand No.
The Aquamellis Engg. Co., Ltd.	B 621
Baldwins (Birmingham), Ltd.	B 722
The Coal Utilization Council	B 715 & 614
Constructors, Ltd.	B 612
Cuxson Gerrard and Co., Ltd.	B 345
W. W. Greener, Ltd.	B 426
Henry Hope and Sons, Ltd.	B 717 & 616
Prior Burners, Ltd.	B 405
Ruberoid Co., Ltd.	B 411
H. C. Slingsby	B 519
Standard and Pochin Bros., Ltd.	B 724
The Valor Co., Ltd.	B 425 & 324

The Gas Section:

	Stand No.
C. R. Averill, Ltd.	Ca 311
Benham and Son, Ltd.	Ca 304
Cambridge Instrument Co., Ltd.	Ca 821 & 720
Cannon Iron Foundries, Ltd.	Ca 601
Cellactite and British Uralite, Ltd.	Ca 705
Dennis Bros., Ltd.	Ca 303
Foster Instrument Co., Ltd.	Ca 307
Grant and West, Ltd.	Ca 807 & 706

The Electricity Section:

	Stand No.
The British Electrical Development Assoc. Inc.	Cb 507 & 406
British Thomson-Houston Co., Ltd.	Cb 605 & 504
Dubilier Condenser Co. (1925), Ltd.	Cb 815 & 714
Evershed and Vignoles, Ltd.	Cb 309
Gent and Co., Ltd.	Cb 606
W. and J. George, Ltd.	Cb 715
Gledhill Brook Time Recorders, Ltd.	Cb 308
N. Greening and Sons, Ltd.	Cb 803
Higgs Motors, Ltd.	Cb 408
Leda Electric, Ltd.	Cb 611
Moulded Products, Ltd.	Cb 315
Rheostatic Co., Ltd.	Cb 511 & 410
Sun-Vic Controls, Ltd.	Cb 900
S. Wolf and Co., Ltd.	Cb 316

The Engineering Section:

	Stand No.
Accles and Pollock, Ltd.	D 506
Edgar Allen and Co., Ltd.	D 806
Ashwell and Nesbit, Ltd.	D 419
W. and T. Avery, Ltd.	D 613 & 512
Babcock and Wilcox, Ltd.	D 501 & 400
W. S. Barron and Son, Ltd.	D 611
Britannia Tube Co., Ltd.	D 523 & 422
British Rema Manufacturing Co., Ltd.	D 903 & 802
Camco (Machinery)	D 727
J. Collis and Sons, Ltd.	D 217 & 116
R. and J. Dick, Ltd.	D 311
F. J. Edwards, Ltd.	D 505
J. H. Fenner and Co., Ltd.	D 622
Firth-Vickers Stainless Steels, Ltd.	D 513 & 412
Samuel Fox and Co., Ltd.	D 829 & 728
Greenwood and Batley, Ltd.	D 425 & 326
Imperial Chemical Industries, Ltd.	D 405
Johnson Matthey and Co., Ltd.	D 711
Langley London, Ltd.	D 112
R. A. Lister and Co., Ltd.	D 304
Meldrums, Ltd.	D 325 & 224
Niagara Screens (Gt. Britain), Ltd.	D 913
Payne and Griffiths, Ltd.	D 102
H. Simon, Ltd.	D 611
J. M. Smith and Sons (Leicester), Ltd.	D 320
Spiral Tube and Components Co., Ltd.	D 912
Stewarts and Lloyds, Ltd.	D 601 & 500
J. B. Stone and Co., Ltd.	D 817 & 716
Tecalemit, Ltd.	D 515 & 414
Telco Products, Ltd.	D 602
Thomas and Bishop, Ltd.	D 323 & 222
John Thompson (Wolverhampton), Ltd.	D 907
C. C. Wakefield and Co., Ltd.	D 603 & 502
James Walker and Co., Ltd.	D 606
Henry Wiggin and Co., Ltd.	D 413 & 314

ALUMINIUM TECHNICAL DATA

The Birmingham Aluminium Casting (1903) Co., Ltd., are to be congratulated on their Technical Data Book recently issued. This deals mainly with Aluminium, but data concerning "Elektian" magnesium alloys, Zinc Base, Tin and Lead Base alloys, in which the company also specialise in making castings, is included.

The book is a model of orderliness and accessibility. There are nineteen separate data sheets for different alloys, each having the information set out in precisely the same form and order, under headings such as "Properties and Applications", "Composition", "Physical Properties", "Mechanical Properties", and so on. British Standard and Air Ministry D.T.S. Specification figures are quoted wherever they apply.

Some notes on resistance to corrosive action are to be found in connection with most of the alloys, but the most valuable contribution on this subject is a 10-page Appendix entitled "Corrosion and Protection against Corrosion, with particular Reference to Aluminium Alloys". Instead of listing materials to which alloys may or may not be resistant, this thesis emphasises both the variability due to conditions and the predominant influence of the alloying constituents. Thus corrosion resistance is explained from the point of view of the effects of different alloying elements as a general guide to the behaviour of alloys in which they are incorporated; so that anyone contemplating a particular application can readily decide from which group of alloys to make a choice, having in mind mechanical requirements which can be decided from reference to the data sheets. This is much more satisfactory than attempting the almost impossible task of providing information about specific materials or applications for which varying conditions of concentration, moisture content, temperature, etc., must also be taken into account.

Three other Appendices deal with The Machinery of Aluminium Alloys, Pressure Die-Casting Limits and Tolerances, and Tables of Comparative Data made up from figures in the data sheets.

We can perhaps be excused a legitimate pride in this publication, for which our Managing Editor, Mr. G. W. Lacey, was intimately responsible just before joining us.

Technical Data. Issued by the Birmingham Aluminium Casting (1903) Co., Ltd. Pp. 90. Price 2s. 6d.

Novelties in Packing

(1)

(2)

(1) An ingenious two-lemon package developed for Lemonina in the U.S.A., giving accurate measured quantities, easy dispensing, and good display.

(3)

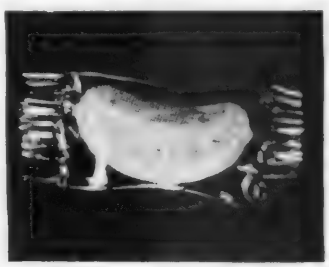
(2) A new opener for waxed cartons for milk and other dairy produce which was recently evolved by Mr. J. A. Darby, Sales Manager of Herbert Terry and Sons, Ltd. A sharp upward pull on the pull-tab opens the carton without damaging it in any way.

(With acknowledgements to "Packaging and Design".)

(4) A new method of attaching keys to cans by the Key Clinching Machine recently produced by the Metal Box Co., Ltd. This picture is of the new tapered Heinz fig pudding can, which is being fitted with this key.

(3) Boxes wrapped with Dennison's new Excell-o ribbon, an attractive Cellophane newcomer which is likely to prove very popular. It is sold in plain colours or with printed designs, fadeless, dustproof, and radiantly beautiful.

(4)



(5)

(5) A moisture-resisting packet for individual hard sweets developed by Henry Heide, Inc. of New York.

(With acknowledgments to "Food Industries," U.S.A.)

(6)

(7)

(7) A new method for opening cans developed in Switzerland and called the Ti-Bo-Ri. Lift the loop, pull and a piece of wire slits open the whole lid. What a boon for the housewife!

(With acknowledgments to the "Advertising World".)

(6) Sweets wrapped by the Combined Twist and Fold Wrapping Machine made by Otto Hansel, of Dresden, the agent in this country being Bramigk and Co., Ltd. The one machine will wrap round, oblong and oval sweets.

The DAMAGE to PEARS PACKED in CASES

By D. J. Dreyer

This paper was presented at the discussion of problems of fruit storage and transport held on August 29 in London during the Imperial Botanical Conference. The conclusion of this paper (Part II) will be given in our next issue.

PART I.

SOUTH AFRICAN exports to the United Kingdom are approximately 55,000 cubic tons of deciduous fruit in a season, which lasts from mid-December to mid-June.

The Western Cape Province produces practically the whole of the quantity of deciduous fruit exported, and the transport of the fruit from the orchards to the docks involves a railway journey of from eleven to one hundred and fifty miles. Of the twenty to thirty different kinds of deciduous fruit exported, pears alone account on the average for well over a quarter of the total exports.

More than thirty different varieties of pears are exported, six of which—namely, Bon Chretian, Beurre Bosc, Winter Nelis, Keiffer, Louise Bonne, and Glou Morceau—account for more than 60 per cent. of the pear crop. Bon Chretiens alone account for approximately 25 per cent. of the pear exports.

Previous to the 1927-28 export season pears were packed mostly in single layer trays lined with woodwool.

In order to reduce packing costs and to meet the requirements of a market on which a luxury pack such as the single layer tray pack was rapidly exceeding the demand, growers resorted more and more to double and multiple layer packs until during the 1927-28 season a definite start was made to pack pears in cases.

The decline of the tray and the advance of the case as a container for export pears was very rapid. During the 1927-28 season 99 per cent. of the crop was packed in trays, but only 19·3 per cent. of the crop was packed in this container during the 1933-34 season.

Two types of cases were used: the standard bushel case, 18 by 11½ by 10½ in. deep, and a case similar to that used in California, 18 by 11½ by 8½ in. deep. The use of these two different cases caused marketing complications, and receivers advocated the adoption of either one or the other, but expressed a preference for the Californian 8½-in. deep box.

Californian pears arriving on the United Kingdom markets were packed in these cases to nett weights ranging from 42 to 46 lb., and receivers expressed the opinion that, if South African pears packed in the Californian case, which had been adopted as the standard South African container, were to compete successfully with those of California, it was essential that the South African cases should be packed to the same capacity.

It is a curious fact that, of two cases of different depth, packed to the same nett weight of fruit, the buyer will invariably show preference for the shallower case, which naturally has the higher bulge, and out of which the fruit appears to be overflowing. The need for a box of standard capacity packed within limits to a standard nett weight is thus essential in order to avoid the fruit from one grower competing with that of another.

The grower or packer has a wide range of counts to choose from, and is thus able to control the tightness of the pack. The tighter the pack the higher the bulge on the lid and the bottom of the box. The question which arises immediately is: How tightly may pears be packed with safety or what is the relationship, if any, between the bulge on the box and the keeping quality of the fruit?

FIG. 1.—Keiffer Pears: "B" signifies box-bruised fruits; "A" signifies fruit-bruised fruits.

Type of Injury Found in Case Packed Pears

The first tests[1] carried out in South Africa during 1933 gave some interesting results—namely, that the tighter the pack the greater was the

[1] Case Packing of Pears for Export, V. A. Putterill and D. J. Dreyer, *South African Department of Agriculture, Bulletin No.* 124.

amount of bruising caused at packing time. On the other hand, rough handling is apparently more harmful to a slackly packed box than to one tightly packed. It is likely, however, that the simulated rough handling to which the cases of the test were subjected was somewhat more severe than that of normal handling in transit. Incidentally these results agree very closely with some work which has been carried out by Carne and others in Australia. The tests have been continued by shipments of experimental consignments (under commercial conditions from South Africa to London).

A standard method of classifying fruits as severely bruised, slightly bruised, or sound was adopted for the examination of all experimental packages. The standards were such that fruits classified as *severely* bruised, were bruised to such an extent that they could not be overlooked by the trade.

FIG. 2.—Glou Morceau Pears: "B" signifies box-bruised fruits; "A" signifies fruit-bruised fruits.

Fruits were classed as severely bruised if—

(*a*) the fruit had one bruise mark not smaller than a one shilling piece; or
(*b*) two bruise marks each not smaller than a sixpenny piece; or
(*c*) three or more bruise marks each not smaller than a threepenny piece; or
(*d*) if the skin of the fruit was broken in any way.

Fruits which were bruised to a less extent than this standard were classed as slightly bruised. Fruits bruised by contact with the box were further classified as box bruised, and fruits bruised by contact or pressure from adjacent fruits were classified as fruit bruised.

Photographs 1, 2, 3, and 4 are of severely bruised South African Keiffer, Glou Morceau, Beurre Hardy, and Bon Chretian pears respectively. Fruits marked "B" are box bruised, and those marked "A" are fruit bruised.

Very severe types of bruising in instances of which the surface of the fruit is blackened, flattened, or indented over the bruised area are easily detected while the fruit is still in a hard green condition. All types of bruising become very much more apparent and conspicuous when the fruit is ripe and yellow but still firm.

Light, smooth skinned varieties such as Bon Chretian, Clapps Favourite, and Glou Morceau may show bruising more readily than varieties such as Beurre Bosc and Winter Nelis, which do not have such a bright yellow colour when ripe. The Beurre Hardy variety may bruise very much more severely than is superficially apparent. The skin over the bruised area may remain green and normal, although flattened or indented. The flesh immediately underneath the bruised areas may, however, become dry and cordy. Such pears on being peeled are quite unsightly, and in many instances only half the fruit is edible.

Photograph 5 is of this type of bruising of Beurre Hardy pears. Fruits which showed no apparent bruising or wastage were classified as sound.

Extent of Injury in Commercial Consignments

Experimental consignments under commercial conditions were conducted during 1934.[2] Eight varieties were included in these tests, and approximately three hundred cases were shipped. All the shipments were discharged at Southampton and conveyed in the ordinary way to London. The interval between shipment and discharge may be taken at about eighteen days.

The average percentage amounts of *severe* bruising and waste which was noticeable at the first examination in London, when the fruit had ripened and commenced to yellow, were 24 and 4 per cent. respectively over all the experimental cases, including all varieties.

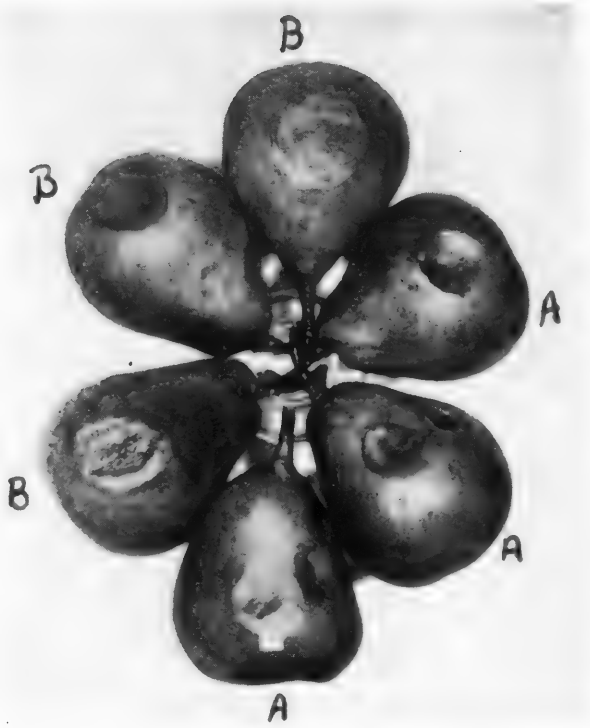
Even if one could ignore the effect of bruising on the appearance and thus on the sales value of the fruit, the seriousness of this damage would still be great because bruising has an effect on the keeping quality.

Tests in which the keeping quality of bruised Beurre Bosc and of Bon Chretian pears was compared with that of the apparently unbruised fruits, showed the keeping quality of the latter to be from 33 to 50 per cent. better.

The amounts of *severe* bruising in each of the varieties of pears included in the tests were: Louise Bonne 41, Glou Morceau 36, Josephine de Malines 32, Bon Chretian 27, Beurre Hardy 27, Winter Nelis 22, Beurre Bosc 13, and Keiffer 12 per cent. In the case of the Glou Morceau variety, it is probable that the fine skin texture and light colour are responsible for the large percentage of bruising recorded.

The extent to which pears may be bruised before the

[2] Progress Report, Pear Packing, Experiments Season, 1933-34. V. A. Putterill, *South African Co-operative Deciduous Fruit Exchange Bulletin.*



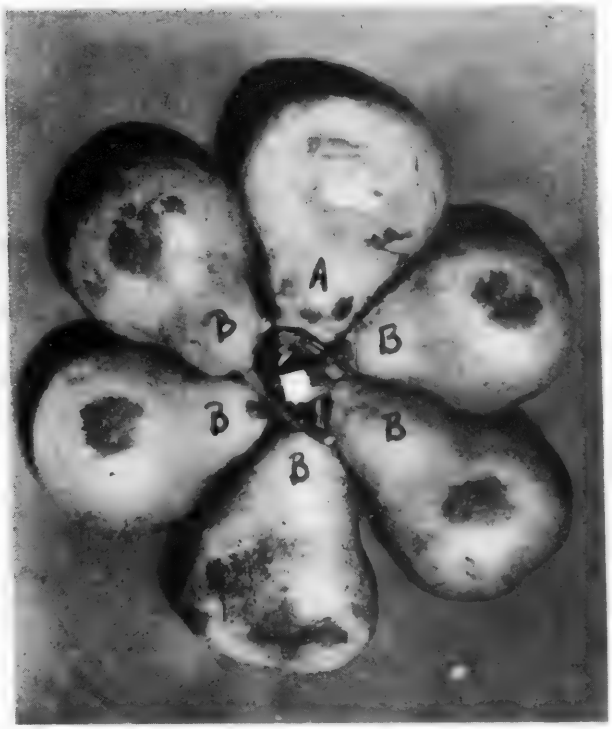


FIG. 3 (*top left hand*).—Beurre Hardy Pears: "B" signifies box-bruised fruits; "A" signifies fruit-bruised fruits.

FIG. 4 (*top right hand*).—Bon Chretian Pears: "B" signifies box bruising; "A" signifies fruit bruising.

FIG. 5 (*bottom*).—Beurre Hardy Pears: Internal corkified bruising.

keeping quality is impaired has not yet been determined, and it is probable that the keeping quality of even slightly bruised fruit is impaired. It is therefore possible that in estimating the damage due to packing, not only *severe* bruising but even slight bruising should be taken into account.

Extent of Injury in Relation to Tightness of Pack

Experimental shipments under commercial conditions conducted during 1935 included 150 packages of Keiffer pears packed in single layer trays, two layer half-boxes, and four layer Californian cases.

The half-boxes were packed to nett weights ranging from 18 to 21 lb. and the cases from 38 to 46 lb. In each type of package the nett weight was enlarged by increasing the size of the fruit and not the number of fruits packed. The object of the test was to ascertain the percentage of bruising and the condition of the fruit in cases and half-boxes packed to varying degrees of tightness and at the same time to compare the condition of comparable fruit packed in single layer trays.

Owing to the varying weight and capacity of each type of container, the gross or nett weights of packages are in themselves not sufficient to compare accurately the degree of tightness to which individual or a set of containers are packed. Apparently similar cases containing the same nett weight of fruit at the time of examination gave appreciably different results in the percentage bruising. When, however, the depths of the cases were measured they were found to vary sufficiently to account for the differences in the extent of bruising. The variation encountered over 50 cases was from a depth of 8-8/16 to 8-11/16 in.

(*To be concluded next month.*)

The Principles and Practice of MEAT CANNING

By A. SAMSON, A.R.C.S., A.I.C.

Part III.

Retorting

ONE OF the most important processes in the technique of meat canning is that known under the various names of "Sterilisation", "Retorting", or "Processing". This involves the subjection of the filled sealed container, glass or tin, to heat treatment for a definite length of time at a definite temperature. The heating medium may be steam only or a mixture of water and steam. (Calcium chloride baths are relics of the past.) The temperatures may cover a range of 180° to 250° F. The time of the process may be as short as 30 minutes or as long as several hours.

The principal object of this process is to destroy all the harmful organisms in as short a time and at as low a temperature as possible. Let it be distinctly understood that it is not absolutely necessary to effect destruction of *all* the organisms present in the material. Some products will not stand such severe treatment.

The sole aim of the meat canner is to produce "commercial sterility", a term which has been fully defined at the commencement of this series of articles.

The retorting process must not be looked upon as a cooking operation, although the products are fully cooked during the process. Rather should it be considered, primarily, as a heat treatment to destroy the dangerous organisms, which treatment produces final cooking of the contents of the containers.

Practically all canned meats require longer processes to produce commercial sterility than are necessary to produce sufficient cooking. There are some exceptions, however.

It can therefore be assumed that in the production of commercial sterility the contents are sufficiently cooked.

General Considerations

I do not propose to discuss here the bacteriology of canned meats. It is sufficient to state that the dangerous bacteria in such products are known as Putrefactive Anaerobes. These are spore-forming organisms and require a high temperature for their destruction.

Before deciding on what will be a satisfactory process for any meat product, there are many points to consider, apart from the types of bacteria that may be present. There is the size of the container, the heat penetration of the material (both contents and container), the chemical reaction of the contents (pH value), the reaction of the contents to the application of heat, the condition of the contents (large pieces, small pieces, minced, liquid present, liquid absent), etc. It is impossible to lay down a process unless one has complete information concerning the article to be processed. Consider, for instance, tinned ham and tinned brawn. The organisms in both articles may be similar. Ham has a higher salt content than brawn, but ham is never subjected to the same process as is brawn, which may be treated at 220° to 240° F. If ham were processed at such high temperatures it would be unsaleable. It would be overcooked and the waste would be excessive. In consequence, hams are processed at 180° to 200° F. for a much longer period of time.

Another important point to be considered is whether the article is to be preserved for all time, or for a period of a few months only before consumption, for export purposes, or for home consumption. One has to consider the condition of storage to which the contents will be subjected and to what parts of the world the canned meat products will be shipped, which will involve temperatures of storage. Is the article to be used for spreading or slicing, hot or cold? Does it contain gelatin or not? These are some of the questions that have to be answered before a satisfactory process of sterilisation can be suggested for any product. Some articles can be subjected to high temperatures for fairly lengthy periods—soups, for instance. Others cannot be subjected to high temperatures without spoiling the appearance—such as ham and similar pork products.

Some products are apt to shed too much juice during application of high temperatures or long heating periods, producing dry, tasteless meat and much exuded liquid.

Individual Products

It will be interesting to consider some of the various products found under the category of canned meats, studying the effect on them of this final sterilisation process. Most tongues can stand high temperatures and long application of heat fairly well, though if the tongues are fatty, especially the large size ones, this statement does not hold good. The tissue tends to disintegrate, so rendering the product difficult to cut and slice with the knife.

Products in which there is much jelly added are apt to be softened with the application of high temperatures and long heat treatment.

Briskets are not improved by high temperatures. Long heating periods produce dryness and stringiness. Tinned briskets require very careful treatment.

Hams cannot be subjected to high temperatures, as their appearance will be ruined. There will be too great

a liberation of jelly and fat, producing excessive waste. Canned hams for home consumption are processed at 180° to 190° for long periods, and for export purposes the temperature is increased to 200° to 212° and even 220° F. for a short time.

Soups can be subjected to long periods of high temperatures within reasonable limits.

Minced products, as pâtés, rolls, galantines, can be subjected to high temperatures and lengthy periods, providing there is not too much fat present.

Brawn cannot be subjected to too high temperatures for lengthy periods as the meat is considerably softened, hence processing is carried out at lower temperatures for a greater length of time.

Sausages are ruined by high temperatures, which burst them.

Chicken and such products are spoilt by high temperatures, rendering the meat soft and unpalatable.

Let it be remembered that continued application of heat, even though the temperature may not be as high as 240°, tends to produce undesirable results in meat products, such as discoloration, staining of the cans, over-softening of the tissues, weakening of the jellies, over-cooked flavours, dryness, exudation of fat and juices, and many other unsatisfactory features.

It will be readily appreciated from the foregoing remarks that the preparation of the processing formula is a very difficult undertaking, and hence I feel justified in stating that the process of sterilisation or retorting is the most important chapter in the whole subject of meat canning, as its object must, of necessity, be to produce "commercial sterility" in as short a time and at as low a temperature as possible.

Types of Retort

The plant in which this sterilisation process is carried out is known as "retorts", "pressure kettles", or "autoclaves". These may be horizontal or vertical, cylindrical or rectangular, steel vessels, which can be sealed after they have been filled with the canned products, and which are then heated, either by steam or a mixture of steam and water. Vertical vessels are always cylindrical, but the horizontal retorts may be cylindrical or rectangular.

Processing of Cans

I propose to deal first with the processing of tin containers in retorts. Tins are almost always heated in steam alone and very seldom in a mixture of steam and water.

The art of retorting is to obtain uniform temperatures throughout the steam space in the retort, so that each individual container receives the same heat treatment. The steam circulation must be as near perfection as possible. There must be no "air" or "dead" pockets. This efficient distribution of steam depends as much on the design of the retort as on the technique of the processor. A badly designed pressure vessel or bad manipulation on the part of the operator may cause under-sterilised canned products with resultant spoilage.

The retort should be designed so as to give not only good steam distribution but efficient circulation. The distribution is obtained by the correct positioning of the steam inlets and the circulation by the correct bleeding of the retort with the aid of bleeder cocks or small pet cocks placed in different positions on the retort.

Either horizontal or vertical retorts may be used. But for the inconvenience and extra expense of the provision of overhead gear for loading and unloading vertical retorts, my opinion is that the vertical retorts produce more sure results than the horizontal types. Steam distribution is better and manipulation is easier, whereas horizontal retorts are liable to give rise to uneven temperatures or "pockets".

It is essential in all cases to possess accurate and good thermometers and pressure gauges, and the processor is advised to sterilise by the thermometer and not by the pressure gauge, which is really a stand-by or a "second string".

In a successful process it is essential that all air be removed from the steam space. The cans are to be processed by steam alone and not a mixture of air and steam.

Controlling instruments for temperature and pressure are most useful and economical in the long run.

Retorts may be packed full providing there is a reasonable space between the bottom layer of cans and the point of steam entry. All steam should enter the retorts from the bottom and not from any other point.

It is much better to equip retorts with large-sized pipes and valves, using low pressure steam of 20 to 30 lb. per square inch, than with smaller pipes and valves using high pressure steam of the order of 60 lb. per square inch. It is unnecessary to use high steam pressure for processing. Actually it is volume of steam and not pressure that is required. As the maximum temperature of sterilisation is normally 250° F., which is equivalent to a steam pressure of approximately 15 lb. per square inch, it will be quite sufficient to provide the retorts with 30-lb. steam mains, providing they are all of sufficiently large diameter.

All retorts, vertical and horizontal, should be provided with water cooling systems in order that cans may be cooled immediately after the steam process. Retorts should be equipped with efficient safety valves, and it is incumbent upon every canner to make sure that his retorts will be able to withstand the pressures to which they will be subjected and possess, over and above this pressure, a margin of safety.

Horizontal rectangular retorts normally stand up to 10 lb. per square inch working pressure. If they are specially strengthened they can be worked up to 15 lb. per square inch. Horizontal circular retorts can be made easily to withstand 20 to 25 lb., and most vertical retorts, particularly in those factories which process glass-packed meats under the air pressure system, are made to withstand working pressures up to 35 lb. per square inch. Neglect of the safe working pressures of retorts may lead to accidents.

The correct manipulation of the retort must be stressed. After the retort is filled, it is sealed, all bleeding valves are opened, and steam is turned on at a fairly rapid rate, the cocks being open to allow of the free escape of air. No pressure must be allowed to build up inside the retort

until a temperature of at least 180° to 190° F., and then, after that, the pressure should not be more than 1 or 2 lb. greater than corresponds to the temperature showing on the thermometer. A too rapid entry of steam into the retort is liable to build up pressure internally long before the cans have been heated sufficiently to give them an opportunity to withstand such pressure. This building up of internal pressure is often the cause of buckled or panelled cans, particularly in the case of those cans which are slack filled or filled with liquid such as soups, etc.

The operation of raising the temperature should take about 12 to 15 minutes.

The most important stage is raising the temperature from cold to 180° to 200° F., during which time all air must be removed from the retort and all bleeding cocks wide open. When the temperature of about 200° is reached the bleeders can be partially closed, so that the temperature will rise, as will also the pressure. Eventually the required temperature of sterilisation will be reached and the retort is then "settled down". At first it will be found that the pressure is 1 to 2 lb. per square inch higher than that corresponding with the thermometer. But after about 5 to 10 minutes' run the two instruments will be in agreement. It is imperative, once the sterilisation temperature has been reached, and during the whole interval of its maintenance, that the bleeder valves be slightly cracked open in order to allow slight escapes of steam from them, particularly from those in the vicinity of the thermometer. This bleeding promotes circulation of steam and allows the removal of air in the retort and produces uniformity of temperature throughout the steam space.

Cooling

At the termination of the heat treatment I advise the cooling of the cans in the retorts by means of the introduction of cold water. This is an operation that must be closely controlled, otherwise great damage will result.

It is generally known that all the cans in the retort at the end of the process are under great internal strain, possessing internal pressures which are tending to burst them. It is also appreciated that the introduction of cold water into a steam space will immediately condense the steam, so turning what was at one moment a positive pressure into a negative pressure or vacuum. It is this sudden production of a vacuum which is dangerous. While the cans are in the retorts their internal pressures are, up to a point, offset by the pressure of the steam in the retort surrounding them. Consequently the strains on the cans are reduced. But the moment the pressure, due to the steam, is removed, the internal pressures of the cans exert themselves to their fullest extent, often bursting the cans, or at any rate weakening the seams to the point of formation of minute leaks and cracks. In order to prevent this sudden condensation and consequent loss of pressure on this introduction of water, all meat canners should use the compressed air method. In this method, as soon as steam is shut off and just prior to the introduction of water, compressed air is blown into the retort so as to build up a pressure in the retort equal to 3 or 4 lb. higher than that at the termination of the process. When this point is reached the water is turned on, first slowly, into the retort, gradually increasing the volume. The presence of the compressed air overcomes the danger due to the condensation of the steam. In a short time the water can be turned on full without danger. Once all the cans are covered with water the retort pressure must be gradually reduced until, when the temperature is about 150° to 160° F., the compressed air supply can be stopped and all pressure can be removed from the retort, which can then be unsealed, and the cooling by means of water continued without pressure until the cans are well cooled.

The advantages of this cooling process are obvious and many. The meat is not overcooked, there are no scorched flavours, jellies are not weakened by overheating, all strains are removed from the cans, and the chances of burst or leaking cans are considerably minimised.

Many canners do not cool their cans in the retort at all, but prefer to blow off the steam at the end of the process, unseal the retort, remove the cans, and place them under a shower or spray of water until cold. I do not approve of this method; it prolongs the period of cooking, which, from previous remarks, is most undesirable. But, more than this, the release of the steam means the removal of the pressure in the retort surrounding the cans. This allows the internal pressure of the cans to exert their full force, with consequent strains on tinplate, seams, and joints. The canner is inviting spoilage, and very often receives it. This method of cooling is frequently the cause of blown cans, completely inexplicable to the manufacturer himself, but readily explained by the weakening of the solder at the joints or slight opening of the seams in the case of double-seamed cans, thus allowing the entrance of air and organisms, with consequent spoilage in a short time.

Sterilisation of Glasses

Enough has been said concerning sterilisation of cans, and I now pass to the consideration of sterilisation of meats and allied products packed in glass containers.

In many concerns which pack products in glass and seal them by means of automatic covers (not Phœnix or similar types of caps), the method still exists of clamping down the lids on to the filled glasses, packing into retorts, sterilising in steam or in water, allowing the lid and clamp to act as "valves" by the gradual exudation of a certain quantity of the contents, so as later to produce a vacuum, and then at the end of the process removing the glasses from the retort and allowing them to cool naturally. This process is disappointing and lacks any evidence of scientific application. It is costly, wasteful, dirty, inconsistent, and uncontrollable. Sometimes the valves do not function as desired, the contents may be spoiled, "dunnies" are produced, lids and rubber rings wasted. The process is out of date and should have been relegated to the museum of old-fashioned methods. To-day it is replaced by the more scientific method of "vacuum-closing" and "sterilising in water under air pressure". The closing of the glasses has already been discussed, the glasses being covered by automatic or Phœnix or any other types of lids. Sterilisation of these glasses is done by water.

Even though a glass may have been vacuumised prior

to using, there is sufficient pressure generated in the container during the heat treatment or process to blow off the cover, so this is counteracted by what is known as a "counter-balancing air pressure", which is more than sufficient to prevent the lid being lifted from its rubber seating.

The retorts are filled with glasses which are then covered by cold water. The retort is sealed and compressed air is blown in to register about 10 lb. per square inch pressure. Steam is now turned on and the water gradually heated, at a predetermined rate, the air supply still being maintained so that the pressure in the retort increases with the increasing temperature. Eventually, when the temperature of sterilisation has been reached, the pressure in the retort must be at least 15 lb. per square inch higher than would be the normal steam pressure corresponding to the temperature. This excess of pressure *must* be maintained throughout the whole of the heating process. At no time should it be allowed to drop by more than 1 to 2 lb. per square inch. In this way the exudation of the contents is avoided, covers are prevented from lifting, and the glasses are kept sealed throughout the whole process.

At the end of the process of heat application, strange as it may seem, it is possible to cool hot glasses by the immediate introduction of cold water. This must not be done rapidly, however—only a definite flow of water can be allowed after the steam has been turned off—so as to reduce the temperature of the retort by 2° to 4° per minute, depending on the size of the glass containers.

The compressed air supply and the pressure *must* be maintained throughout the whole of the cooling process until finally a temperature of 90° to 100° F. is reached, when the water and air supply may be stopped, the pressure in the retort is gradually released, the water is run off, and the glasses may be removed from the retort. They will be found to be considerably cooled, clean, and vacuumised.

The older process of valve action really presents no case in comparison with the modern air pressure process.

Final Cooling and Storage

After processing, all preserved articles, glass and tin, should be allowed to remain without disturbance, at least overnight. This allows the jelly to clarify itself, to cool and set, and also allows the steady cooling and shaping of the rest of the contents. This slow overnight cooling is important.

When the articles are completely cold they must be examined for soundness or loss of vacuum. The suggestion that they remain untouched after processing for several hours is in order to assist any small leaks or defective containers to manifest themselves, which will be found by the examiner, who should be skilled in this type of work so that he can appreciate the difference between a sound and an unsound container.

Storage of canned meats and allied products, while perhaps not such an important consideration as the storage of canned fruits, merits attention.

Coolness of storage is important. Jellies set firmly. Meats shape better and become better resistant to cutting and slicing. Staining of unlacquered plate is minimised, and in those cases where definite destruction of all bacteria is not aimed at, the shelf life of the article is lengthened.

Glassed goods also benefit from cool storage. There is less possible chance of rubber joints perishing, although the standards of rubber rings or cords to-day are beyond all the dreams of a few years ago. Modern rubber cords stand up to all sorts of conditions without deterioration.

Light on glassed packed articles has a tendency to bleach the delicate colours of some of the meats, particularly tongues, so I advise them being stored in cool places where the light is subdued.

Samples of all packs should be incubated at 98° to 100° F. for at least 7 days—longer if possible. Understerilised meats will show themselves. No parcel of canned meats should be allowed to leave the factory until a sample from the consignment has passed satisfactorily through the incubator test.

A word about utensils and the general plant in the meat canning concern.

While it may not be possible to remove all wood from the factory, I would limit its use to the smallest possible extent. Wood in a meat factory is dangerous. It is exceptionally porous, and these pores harbour organisms, bacteria which are or may be dangerous. Different batches of meat may be infected if wooden utensils are used. Spoilage may result from wooden plant. It is impossible to clean wood from a bacteriological sense. Use as little wood as possible, if at all.

I definitely exclude copper from a meat factory. This metal produces staining of meats, particularly black staining, owing to the dark coloured copper sulphide. Even tinned copper is dangerous; the tin coating will soon be removed, exposing the undesirable copper.

Galvanised iron is not satisfactory; zinc is gradually removed, sometimes finding its way into the meats. It is used, however, to a large extent where in contact with cold meats only—for instance, for table tops, shelves, etc. It is fairly widely used in factories because of its cheapness.

Aluminium is widely used and is a very useful metal. It presents no staining or discoloration problems, but it presents a big problem of corrosion in the presence of strong salt solutions, and the canner is advised against the use of aluminium in the presence of brines, etc.

The three most important metals to-day are stainless steel, nickel, and monel metal. Of these I prefer stainless steel, as there is always the danger, even slight, of discoloration or staining on account of nickel or the copper in monel metal. Good stainless steel presents practically no corrosion or staining problems. It must be appreciated that there are different varieties of stainless steel. Not all are suitable for factory plant. Some do not stand up to salt solutions. When considering stainless steel plant it is as well that the meat canner acquaints the fabricator of such plant with the purposes to which he intends to put the plant. To-day it is possible to obtain tables, steam pans, tanks, trucks, and any form of vessel made from stainless steel, and while it may appear expensive at first cost, the meat canner will never regret the investment.

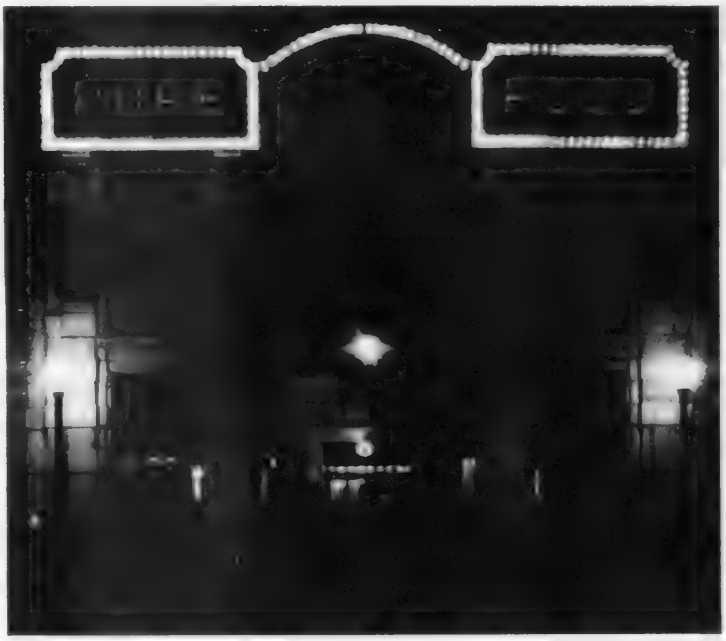
A note on some correspondence received in connection with this article is given on page 68.

FOODS DISPLAYED IN TORONTO

Some Impressions of the CANADIAN NATIONAL EXHIBITION

By Neil Fisk

(Special Representative of "Food Manufacture")



The exterior of the Food Products Building, at the Canadian National Exhibition, by night.

THE CANADIAN National Exhibition at Toronto was held last year from August 23 to September 7, inclusive, this being its 57th consecutive year. This is certainly a remarkable record, and when I visited the exhibition on August 28 I was told that it was the only general trade exhibition anywhere in the world to have been held regularly every year for such a long period. A brief historical note on the exhibition itself will perhaps, therefore, not be out of place.

Its history is even more extensive than is indicated by the fact that this was its 57th anniversary. It is the direct outcome of the "Niagara Agricultural Society", formed in 1792 as the first agricultural society in Upper Canada for the development of agriculture by the early pioneers. No Government help was given to this society, which struggled on with many changes of fortune for a period of fifty-four years.

In 1846 was started a movement to organise an itinerant Provincial Exhibition, the first of these being held at Toronto in the same year; the old Niagara Agricultural Society then passed out of the picture. The Provincial Exhibition in later years visited such cities as Kingston, Hamilton, London (Ont.), Niagara Falls, etc., and was generally a great success, making a number of circuits during the next thirty-three years.

Permanent Exhibition in Toronto

Twelve years later, in 1858, it was felt that the City of Toronto should have permanent exhibition grounds and buildings in readiness for the next occasion when the Provincial Exhibition was to be seen in that city, so, with commendable lack of all those procrastinations and delays to which we are so accustomed in this country, ground was acquired and the first permanent exhibition building erected, after the style of the Crystal Palace, in the same year.

By 1878 it had become clear that the City of Toronto could support a permanent agricultural and industrial exhibition, and, as a result of representations made to the Ontario Government, a Charter was secured the following year. At the same time a large area of ground was secured running right down to the edge of Lake Ontario, and in 1879 the exhibition was held for the first time on its present site, and has been held there every year since. In 1912 the exhibition had so expanded in size and importance that an amendment to the Act of 1879 was sought and secured, whereby the name "Canadian National Exhibition" was adopted.

And now to come to the 1935 exhibition. Readers who remember the 1924-5 British Empire Exhibition at Wembley, England, will have a fair mental picture of what the Canadian National Exhibition looked like in a general way. The buildings in this case were, of course, more substantial, but the lay-out of the grounds was very similar, with "streets" connecting the various buildings and, it must be confessed, the same prevalence of dust and litter that was such an objectionable feature at Wembley. The gardens, however, were very much better at Toronto, well laid out with some excellent flower beds and handsome trees. The splendid situation on the edge of the lake was naturally a great advantage, enabling an ambitious programme of sporting activities that

An inspiring exhibition in the Produce Section of the Canadian National Exhibition.

included swimming, diving, boat racing, and sailing to take place.

Pictures of King George V. were everywhere.

The interiors of the various buildings, and the actual stands themselves, varied very much in appeal. Many of them were exactly the same as might be seen at any general or special trade exhibition in this country, while some incorporated novel ideas which might well be noted and used, or modified, by British manufacturers in search of that elusive "something new" for an exhibition stand.

There were very many familiar advertisements displayed.

One of these advertisement posters, "Buy British—E.M.B.", seemed to show that, in spite of its abandonment by the Government during the "economy" scare, the ill-fated Empire Marketing Board is not dead yet, or, perhaps, "He's dead but he won't lie down". The same is true of N.R.A. across the border; literally millions of blue eagles can still be seen all over the country in the U.S.A.

In the Dominion Department of Agriculture was a very fine exhibit showing about twenty-five varieties of sweet corn (known all over the North American Continent merely as "corn"), ranging in colour from near-white to a rich dark maroon tint. This is a staple dish in Canada and the U.S.A., and is indeed very delightful as cooked there, and quite different from what we get in this country in cans.

There was also a Dominion fruit branch, but only a very small exhibit of fruit was displayed.

A fact which I thought very striking was emphasised by a prominently displayed notice in another section, which read: "The tobacco industry in Canada contributes more to the national revenue of the Dominion than any other agricultural commodity".

The British Government Building

I was naturally very interested in the contents of this building, but on the whole I was strongly disappointed by the general effect, as I shall describe.

Huntley and Palmers had a small stand showing most of their varieties of biscuits. All, an attendant told me, were imported from Reading.

Lipton's were housed in a large stand which succeeded in being impressive in a dignified sort of way, and it was a very good idea to provide also a smaller curtained lounge across the gangway where visitors could sit and rest for a while and sip tea (Lipton's, of course!), which was provided gratis. This enterprising firm had another stand in the Food Products Building.

The same commodity was also shown by J. Lyons and Co. (Canada), Ltd., on a very attractive stand masquerading as a timbered house, complete with beams.

This is about all that can be said in praise of the British Government Building, but in the sincere (and earnest) hope that my criticisms will be read in the proper quarters, and some of the troubles put right next year, I will mention some of the other stands, being as merciful as I can.

The Shop Idea

Peak, Frean and Co., Ltd., had what can only be described as a perfectly dreadful stand, just like a small, choc-a-bloc retail shop in Waterloo Road or Second Avenue, New York. The effect was heightened by two men and two girls shouting their wares together at the same time: "Every biscuit different, two packets for a quarter". This was an unfortunate characteristic of the Canadian Exhibition, and more particularly of the British Government Building, which I found deplorable; it was not a case of quietly answering the questions of visitors, but rather put one in mind of the conduct of butchers in Battersea on a Saturday night, or the merchants who retail ladies' underclothing on the Bowery.

Jacob's biscuits were shown on a much better stand, but it still looked like a retail shop. The same remarks apply to Riley's Toffee and Mackintosh's Toffee. The stands were just small shops, each with one or two attendants shouting at the passers-by, who mostly did pass by, quickly.

Chivers and Sons, Ltd., were showing jams, marmalade, etc., on a much more tastefully arranged stand, with no shouting.

"But the general effect in this building was horrible" (I quote from the notebook in which I entered my impressions on the spot). "'Ten cents—two packages for a quarter, every biscuit different—Mackintosh's Creamy Toffee—10 cents a dozen—10 cents . . .' and so on. Continuous babel."

Blue Bird English Toffee had a large, entire stand somewhat better arranged and quiet, but they, too, couldn't seem to get away from the shop idea.

The avenues were very crowded in this building also, and it was difficult to move, even away from the more raucous noises.

I think I will leave this subject now . . . there are some things in my notebook which I'm sure the Editor wouldn't print!

The Dominion Department of Fisheries had got up an excellent display, with light signs *à la* Piccadilly Circus, four revolving multi-faced globes with illuminated coloured pictures of numerous different kinds of fish, and many other fine coloured pictures on the walls.

There was a sort of zoo in a central courtyard of one of the buildings; the animals had horribly cramped quarters, and little brown bears were continually crying, a peculiar sound which I had never heard before. There were two bears in one cage which was approximately ten times their own total *volume*!

The Food Products Building

This was similarly unimaginative in arrangement, most of the stands resembling shop counters, and again there was a babel of shouting. Accordingly, the "Salada" Black Tea stand, which was quite simply arranged, was striking for this very reason. The side walls were made up of large cartons, white with letters in scarlet, and from the centre of the floor these ascended in steps to the middle of the back wall. Above was a huge picture of the pack, framed and lettered "Buy Quality".

Sally Lee Candies had made a crude attempt at spectacular display with a small upper balcony, and on it a girl dressed as a cook with cap and overalls pretending to be making the candies, only we couldn't see what she was doing as no more than her head and shoulders were visible. Descending from the centre of this balcony were two parallel narrow white curved runways dotted with large electric lamps which were automatically switched on and off in an unusually annoying manner, the sort of thing that's all very well the other side of Trafalgar Square, but at close quarters—no! And, finally, my notebook says, "extra shrill shouting".

Californian Exhibit

By far the best stand in this building was that of Los Angeles County, California, though it was difficult to see what it was doing here when they had their own Exposition (which I hope to describe in this journal next month) running at the same time at San Diego. Here were Californian fruits very tastefully arranged on a colourful stand, one attendant and no shouting. Instead, a radio was playing quietly. The background of one side of the stand consisted of a huge picture showing a beach scene typical of Los Angeles and Hollywood, with some of those odd houses scattered on a hillside, and lots of flowers. It was quite true to life, and was probably made up from photographs.

Weston's Olde English Biscuit Shoppe made quite a good display, the central idea being the "timbered" house again. Several other firms adopted the idea at the Canadian Exhibition, so that it was not so effective as if there had been only one or two. In this particular case most of the areas between the "beams" were painted gold, which made the house look very odd indeed. In front was a revolving pyramid-shaped glass-sided stand with the different varieties of biscuits set in the middle of a flower garden.

Aylmer Brand Jams were well arranged, the stand being dominated by a 9-ft. high model of a pot full of strawberry jam slowly revolving. In addition there were huge cut-outs of various fruits—cherries, raspberries, peaches, strawberries, etc.—and two large cylindrical columns of pots of jellies and marmalade illuminated from the middle of each column.

Canada Foils, Ltd., of Toronto, had a very attractive stand, so well arranged from the attention-compelling point of view that, one felt, anyone with a packaging problem would be almost forced to say, "I must use metal foil next time!" Pig lead and tin were shown, together with foils, in many different thicknesses, of these and several other metals; also lacquered and printed foils, and finally examples of their use for wrapping and also for labelling bottles, cartons, etc.

A House Built of Cans!

A different kind of house indeed! This one, another Aylmer stand, was complete with doors, windows, and chimneys, and was built entirely of cans except for the foregoing structural parts; the "bricks" were all cans. May we suggest that the Government might solve the housing problem like this if bricks are *really* too expensive? The effect was certainly very good, and enhanced by the fact that the "house" had all the appearance of solidity, with real doors and windows that opened. All were identical tomato juice cans, each with a picture of two tomatoes printed on the can (not labelled in the ordinary way). Other products packed by the same firm —vegetable soup, "jumbo" peas, etc.—were shown in a glass case in the "front garden", which had flower beds and a lawn.

There was yet another Aylmer stand, next but one to

A wide variety of Australian canned goods in an excellent display at the exhibition.

this, where infant and diabetic foods and other specialities were shown. I spoke to representatives on several of this firm's stands regarding the advantages thought to be derived from scattering a number of different stands in separate parts of the same building, and found that opinion was divided as to the relative merits of the two methods. The advantage of gathering all the exhibits on to one large stand or group of stands is, of course, that very often in such a case an area of the building comes to be known as "So-and-so's Corner". Those in favour of the method adopted by this firm claimed it to be more effective constantly to bring the name before the attention of visitors in different parts of the building. In this case, at any rate, it was done deliberately, and not on account of exigencies of space.

Salada Tea seemed to have the same idea, too, for they also had another stand, this one in the semblance of an Indian temple (but with very Occidental-looking lamp-posts outside!), with lots of little ebony elephants, and different varieties of Salada Tea. I liked their other stand much the best, it was so different from the common run.

Still More Houses

The next two stands constructed on these lines differed in one respect in that they showed interiors, one of a kitchen (Purity Flour), and the other a sort of living room, with numerous packs of Laura Secord Candies. This second house was painted white with a green tile roof, and if it had been the only "house" stand it would have been one of the best stands in the building; as it was, it was one of six or more.

Shredded Wheat were showing a model of the shredding machine, a twin to the model which I had seen in operation, in addition to two double lines of 15 or 20 full-sized machines each, at the great plant at Niagara Falls City two or three days before.

All the good stands seemed to be in this building. In fact, the only really striking stands, or ones with any claim to novelty, that I saw at the Toronto Exhibition were in the Food Building. This, like several of the others, had an open courtyard at the centre, an arrangement which I found most pleasing.

The best thing in the whole show, in my opinion, was the man (actually there were two men) selling a contrivance called a "Hum-a-Tune", the effect being somewhat like that obtained with a schoolboy's "submarine". The shape of the instrument (?) was that of a lens, however. The gags and patter were really very clever, and the salesmen achieved astonishingly accurate imitations of the violin, saxophone, cornet, and trombone. Though, needless to say, nobody else could do it!

Another side-show, before we leave them, was provided by Mr. and Mrs. Dionne, who were autographing pinkish coloured photos of the Quins for a dollar.

Canadian Produce

There was a well-arranged and comprehensive Grain and Fruit Section in a spacious hall; every kind of fruit and vegetable grown in Canada was set out, grouped in classes, on not too crowded stands, and some very extraordinary looking vegetables there were. But they were no doubt very good to eat, because I never tasted any I didn't like while I was in the country.

In conclusion, exhibits incorporating some moving object, automata, revolving showcase or what not, were very few and far between. This was surprising, as such devices are known to be the most attention-compelling of all, and the fact that British manufacturers as exhibitors at trade shows are now realising this fact has already been noted in the pages of this journal. Such exhibits, in some very novel forms, constituted a most striking feature at the California Exposition to be described in next month's issue of FOOD MANUFACTURE.

The stands, and the "avenues" between them, were very crowded at the Toronto Exhibition. Transportation in the grounds was by means of long, light vehicles with canvas tops, pulled two together by miniature automobiles.

An excellent idea was the provision, at night, of music and light which came from a single unit. A number of tall columns, about 9 feet high, in the form of square-section pillars of translucent white glass, had both lights and loudspeakers inside, and shallow, pyramid-shaped "caps" supported a few inches above the top acted as sound reflectors. The effect, at first very surprising, was most pleasant.

DIARIES AND CALENDARS RECEIVED

BESIDES many good wishes, we have received during the past month a number of useful and artistic gifts in the form of diaries, notebooks and calendars. Rex Campbell and Co., Ltd., and the Old Strand Chemical and Drug Co., Ltd., sent indexed diaries; British Vegetable Parchment Mills, Ltd., a blotting pad containing a diary and notebook, the Kynoch Press a useful well-bound notebook, and the Brush Electrical Engineering Co., Ltd., a useful pocket diary. Diaries have also been received from Edwin Jones and Sons (London), Ltd., Grosvenor, Chater and Co., Ltd., the Standard Life Assurance Co., Ault and Wiborg, Ltd., Williams (Hounslow), Ltd., Stothert and Pitt, Ltd., and Billing and Sons, Ltd.

"Sales Management", a stiff hanging calendar containing notebook and indexed telephone directory, Wm. Clowes and Sons, Ltd., a neat desk calendar, and the "At-a-Glance" Calendar Co., Ltd., one of their wall calendars. Stiff hanging calendars, with tear-off bold figure block, from Leighton-Straker Bookbinding Co., Ltd., G. and J. Kitcat, Ltd., Standard Synthetics, Ltd., Loxley Bros., Ltd., Percy G. Thomas, of Neath, and British Industries House.

Chuit, Naef and Co., of Geneva, an extremely well-produced hanging calendar, each page having a beautiful coloured picture of a mountain scene in Switzerland, A. Boake, Roberts and Co., Ltd., a strong block-type desk calendar, and Arthur Holden and Sons, Ltd., a beautifully coloured hanging calendar.

Hanging calendars also from C. Townsend Hook and Co., Ltd., Thames Board Mills, Ltd., H. R. Grubb, Ltd., Frank Turner, Ltd., the American Shipping Co., the Anchor Chemical Co., Ltd., F. J. Parsons, Ltd., H. J. Ryman, Ltd., Flowerdew and Co., Crofts (Engineers), Ltd., Australian Trade Publicity, Johns, Son and Watts, Ltd., Orr's Zinc White, Ltd., and British Industries House. Horace Cory and Co., Ltd., paper-knife.

The EFFECT of APPLES on POTATO SPROUTING

By J. T. Minster, B.Sc., A.I.C.

IN THE Report of the Food Investigation Board for 1932 the statement occurs that Americans have observed that the sprouting of potatoes is retarded by storing ripe apples with them in the same clamp. The Report goes on to describe experiments carried out to investigate the cause of the apples' action and assumes that it is due to small quantities of the gas ethylene.

Copisarow* states that the sprouting of certain varieties of potatoes is inhibited by spraying with a solution of maleic acid in certain organic solvents, and suggests that maleic acid is intimately connected, if not identical, with the germination inhibiting substance found in apples.

This action of apples is apparently little known; many people, connected with potato growing in various ways, have been questioned on the subject and none appears to have heard of it. In spite of the admission by many small growers that they are troubled by their stored potatoes sprouting in spring, the suggestion that an improvement might be brought about by storing apples and potatoes together seems not to have been tested.

* Copisarow, M., *J. Soc. Chem. Ind.*, 1935, **54**, 283. (Quoted in FOOD MANUFACTURE, May, 1935.)

The following simple experiment was carried out in order to obtain some idea of the extent to which sprouting is inhibited by the presence of apples. Kerr's Pink potatoes were grown in Bucks from Scotch seed, lifted in October, and stored in closed tubs in an unheated brick building until December. About 14 lb. of even size, all showing minute "pin point" shoots, were then selected; and from these two 5 lb. quantities, each consisting of 68 potatoes, were chosen. The selection was almost completely random; only two or three were deliberately selected in order to equalise the weights of the two batches. Two cardboard boxes, each 22 by 16 by 10 cm., were used as storage containers. In the bottom of one was placed an apple of unknown variety weighing 5 oz. The box was then filled with one of the 5-lb. batches of potatoes, some being in direct contact with the apple, closed with a well-fitting lid, and wrapped in brown paper. The other box was packed similarly but without the apple. The two boxes were kept unopened, side by side, in an unheated brick building from the date of packing, December 20, until March 20 of the following year—exactly three months.

An illustration showing the Effect of Apples on Potato Sprouting. On the left is a box of potatoes which was stored with apple and on the right is a box stored without apple.

When examined on the latter date it was quite obvious that the apple had exerted a retarding influence on the development of shoots, as is shown in the photograph. The shoots in each box were counted and measured with the results given in the table.

The difference in total shoot length figures and hence between the average lengths of shoot for individual potatoes clearly indicates the effect of the apple. The ratio of total shoot lengths, 2·52 : 1, shows that in the absence of the apple there has been two and a half times the development of shoot occurring in the box containing the apple.

It is possible that a greater difference would have been shown had the potatoes been stored with and with-

TABLE SHOWING THE EFFECT OF APPLE ON POTATO SPROUTING.

Without Apple.				*With Apple.*			
No. of Potatoes.	*No. of Shoots.*	*Length of Shoots.*	*Total Length of Shoot.*	*No. of Potatoes.*	*No. of Shoots.*	*Length of Shoots.*	*Total Length of Shoot.*
1	5	95, 85, 65, 65, 20	330	1	7	35, 25, 20, 20, 15, 10, 5	130
1	6	75, 70, 70, 70, 30, 10	325	1	4	45, 30, 25, 10	110
1	2	130, 120	250	1	3	50, 40, 10	100
1	3	90, 35, 30	155	1	5	35, 20, 15, 10, 5	85
1	2	80, 60	140	1	2	55, 25	80
1	2	120, 15	135	1	2	45, 35	80
1	2	53, 40	95	1	4	25, 25, 15, 15	80
1	3	55, 25, 10	90	1	5	30, 10, 10, 5, 5	60
1	2	80, 5	85	1	3	25, 20, 15	60
1	2	75, 10	85	1	3	20, 20, 20	60
1	2	50, 30	80	1	2	40, 10	50
1	2	40, 40	80	1	3	30, 10, 10	50
1	2	30, 35	65	1	3	20, 15, 15	50
1	3	15, 5, 5	25	1	4	25, 10, 5, 5	45
1	1	120	120	1	2	30, 5	35
4	Each 1	Each 110	440	1	3	20, 10, 5	35
2	„ 1	„ 100	200	1	2	15, 5	20
1	1	95	95	1	2	10, 10	20
3	Each 1	Each 90	270	2	Each 2	Each 10, 5	30
1	1	85	85	1	2	5, 5	10
4	Each 1	Each 75	300	1	1	55	55
4	„ 1	„ 70	280	1	1	45	45
3	„ 1	„ 65	195	1	1	40	40
2	„ 1	„ 60	120	3	Each 1	Each 35	105
2	„ 1	„ 55	110	6	„ 1	„ 30	180
2	„ 1	„ 50	100	6	„ 1	„ 25	150
3	„ 1	„ 45	135	2	„ 1	„ 20	40
4	„ 1	„ 40	160	2	„ 1	„ 15	30
2	„ 1	„ 35	70	6	„ 1	„ 10	60
1	1	30	30	4	„ 1	„ 5	20
1	1	25	25	15	„ 0		0
5	Each 1	Each 20	100				
2	„ 1	„ 15	30				
2	„ 1	„ 10	20				
1	1	5	5				
4	Each 0		0				
68	88		4,830	68	97		1,915

(All lengths in millimetres.)

Average length of shoot per potato ... ... 71·0 Average length of shoot per potato ... ... 28·2

$$\frac{\text{Total shoot length without apple}}{\text{Total shoot length with apple}} = \frac{4,830}{1,915} = 2\ 52.$$

out apples from the time they were lifted, before the incidence of incipient sprouting, which was the initial condition of the potatoes used in this experiment.

The apple had become brown, soft, and slightly mouldy at the end of the storage period, but was fairly dry, not wet and pulpy. The potatoes were finally cooked and examined; there appeared to be no difference in culinary properties between those stored with and without the apple. The practical application of this action of apples will probably interest the small grower rather than the market supplier. At lifting time apples are very cheap (a use might even be found for windfalls) and the addition of a few pounds to each hundredweight of potatoes, stored in as airtight containers as possible, should materially reduce the losses due to sprouting after some months' storage.

VACUUM SEAMING MACHINES

IN the December instalment of "The Principles and Practice of Meat Canning", reference was made to the disadvantage of vacuum double seaming machines in that they did not deal with any type or size of can without a considerable change over, occupying several hours.

We have received a letter from Ashworth and Parker Ltd. correcting this statement and saying: "This does not apply to our machines which have been specially designed to facilitate quick changing. This operation takes less than 30 minutes to change any size within the range for which the machine is intended."

CHEMICAL ENGINEERING CONGRESS

THE provisional Time-table and List of Papers for the Chemical Engineering Congress of the World Power Conference, which is to be held from June 22 to 27 next in the Central Hall, Westminster, has been issued, and the following is a provisional Time-table of Events:

MONDAY, June 22. *Afternoon.*—Official Opening of the Congress. *Evening.*—Reception.

TUESDAY, June 23. *Morning.*—Section A: Ferrous Metals in Chemical Plant Construction. Section B: Refractories, Rubber, Plastics and other Materials in Chemical Plant Construction. *Afternoon.*—Section C: Separation. Section D: Size Reduction, Grading and Mixing; Electrolysis and Electrical Applications. *Evening.*—Free.

WEDNESDAY, June 24. *Morning.*—Section E: Destructive Distillation. Section F: Treatment and Disposal of Effluents and Waste Materials; Lubrication. *Afternoon.*—Works Visits. *Evening.*—Reception.

THURSDAY, June 25. *Morning.*—Section G: High Pressure Reactions and High Vacua. Section H: Heat Exchange. *Afternoon.*—Works Visits. *Evening.*—Official Banquet.

FRIDAY, June 26. *Morning.*—Section J: Education and Training. Section K: Statistics; Administration; Safety and Welfare. *Afternoon.*—Section L: Trend of Development. Section M: General Aspects. *Evening*—Reception

SATURDAY, June 27. *Morning.*—Closing Meeting.

The Congress is being held under the patronage of H.R.H. the Duke of Kent, K.G., K.T., G.C.M.G., G.C.V.O. The President is the Rt. Hon. the Viscount Leverhulme, the Rt. Hon. Stanley Baldwin, M.P., being Hon. President. The various Committees are under Chairmen as follows:

ORGANISING COMMITTEE.—*Chairman*: Sir David Milne-Watson, LL.D., D.L. *Vice-Chairman*: Dr. E. W. Smith, C.B.E.

TECHNICAL COMMITTEE.—*Chairman*: Mr. W. A. S. Calder. *Vice-Chairman*: Dr. F. S. Sinnatt, C.B., M.B.E.

HOSPITALITY COMMITTEE.—Chairman: Sir Alexander Gibb, G.B.E., C.B., F.R.S.Edin. *Vice-Chairman*: Mr. Hugh Beaver.

FINANCE COMMITTEE.—*Chairman*: Mr. J. Davidson Pratt, O.B.E. (Hon. Treasurer).

PUBLICITY COMMITTEE.—*Chairman*: Dr. E. W. Smith, C.B.E.

The number of papers in each of the different sections varies from 5 to 17 as so far announced, but these may be subject to some alteration, as further papers have already been received from other countries. The papers so far communicated have come from Great Britain, Canada, U.S.A., the U.S.S.R., Germany, Austria, Hungary, Holland, Japan, Denmark, Sweden, Switzerland. France is not yet represented, but it is understood that papers have since been received from that country.

In about two months' time it will be possible to publish full particulars of facilities for attending the Congress, admission to which will be by membership fee. A final list of papers, all of which will be printed separately and purchasable before the Congress, will be available later.

Some of the outstanding papers of interest to readers are the following:

Section A.—"Corrosion of Pipe Lines" (Holland), Vereeniging voor Congressen op Electrotechnisch en Aanverwant Gebied. J. Ph. Pfeiffer, C. A. H. v. Wolzogen Kuhr.

Section B.—"Glass Chemical Plant Equipment" (U.S.A.), American Institute of Chemical Engineers.

Section C.—"Filtration" (Great Britain), Institution of Chemical Engineers and Chemical Engineering Group, Society of Chemical Industry. E. A. Alliott.

Section D.—"Estimation of very Finely Disseminated Solids" (Germany), Fachausschuss fur Staubtechnik beim Verein Deutscher Ingenieure. Gonell.

"Electrodeposition as a Chemical Engineering Process" (Great Britain), Electrodepositors' Society. Wynne Williams.

"Electrical Pasteurisation of Liquids" (Holland), Vereeniging voor Congressen op Electrotechnisch en Aanverwant Gebeid. Aten.

Section H.—"A New Method of Evaporation, Operating at Low Temperature with Waste Heat" (Sweden), Swedish National Committee, World Power Conference. H. Elis, H. Goth.

Section K.—"Occupational Risks in the Chemical Industry, and their Prevention" (Germany), Verein Deutscher Chemiker und Deutsche Gesellschaft fur Chemisches Apparatewesen. Martius.

Section M.—"Organised Sponsored Research and its Possibilities" (U.S.A.), Mellon Institute of Industrial Research. E. R. Weidlein.

As mentioned below, The British Chemical Plant Exhibition is being held in conjunction with the Congress in the same building. The Secretarial Office of the Congress, so far as Great Britain is concerned, is at 56, Victoria Street, London, S.W. 1. Communications from other countries should be addressed to the Office of the International Secretary, 36, Kingsway, W.C. 2.

British Chemical Plant Exhibition, 1936

IN July, 1931, the British Chemical Plant Manufacturers' Association organised an exhibition of British chemical plant and apparatus at the Central Hall, Westminster, in connection with the Jubilee celebrations of the Society of Chemical Industry. Since then, references have been made from time to time as to the desirability of repeating this exhibition; in particular, the opinion has been expressed in certain quarters that there should be a section for chemical plant at the British Industries Fair. The conclusion has, however, been reached that the best results are obtained by organising an exhibition in conjunction with some chemical or chemical engineering gathering, such as the Jubilee celebrations already referred to, because the double attraction brings a much larger number of interested visitors, both from home and overseas. At the same time a number of firms regularly exhibit at the Birmingham section of the B.I.F., but these invariably have considerable interests outside the strict conception of chemical plant.

In 1931 an agreement was reached with the corresponding Associations of French and German chemical plant manufacturers to hold an exhibition in rotation in each country, so as to avoid clashing. Owing to the abnormal conditions caused by the depression it has not been possible to adhere strictly to this arrangement, but, nevertheless, clashing has been avoided. The German Achema VII. was held in May, 1934, while the next exhibition of British chemical plant will be held from June 22 to 27, 1936, at the Central Hall, Westminster, in connection with the International Chemical Engineering Congress of the World Power Conference. The Congress and the Exhibition will be held in the same building, whereby it is hoped that this proximity will offset to some extent the admitted drawbacks of this particular hall from the exhibition point of view. The Department of Scientific and Industrial Research has also undertaken to organise a research exhibition on similar lines to the one arranged in 1931, to show the benefits of organised research to industry.

We understand that the theme of the combination of Congress and Exhibition will be chemical engineering in all its numerous ramifications, with special emphasis on the part played by the United Kingdom. Some twenty countries, including those of greatest industrial importance, will be participating in the Congress.

The total exhibiting area will be about 13,000 sq. ft. Five thousand copies of the Exhibition catalogue will be issued and it will contain a brief account of each individual stand. The Regulations for the Exhibition and the forms of application for space can be obtained from the British Chemical Plant Manufacturers' Association, 166, Piccadilly, London, W. 1.

FOOD MANUFACTURE will be represented on our own stand at this Exhibition.

INDUSTRIAL NEWS

Health Exhibition, Southport

The next Exhibition of the Royal Sanitary Institute is to be held at Southport in July, 1936, in connection with the Health Congress, and will be attended by representatives of municipal and other authorities from all parts of the works, members of the various trades and professions in and around Southport, and the general public.

Applications for space already received at 90, Buckingham Palace Road, indicate a successful exhibition, as seems always to be the experience of the Royal Sanitary Institute.

New Vaccine for Cattle

The Joint Committee of the Medical Research Council and the Agricultural Research Council on Tuberculosis recently issued their observations on the experiments carried out on cattle in Northern Ireland with Spahlinger anti-tuberculosis vaccine.

After considering the report of the Spahlinger tests, the Joint Committee state: "A case has been made out for further investigation, and we are of opinion that a thorough test should be made in this country, if Mr. Spahlinger is found willing to supply vaccine in sufficient quantity for the inoculation of a suitable series of animals.

"We would urge that, until the vaccine has been shown by further and extended experiments to be effective against natural as well as experimental methods of infection, its practical application should be deferred. We would deprecate most strongly its enforced general use until a thorough investigation has been made."

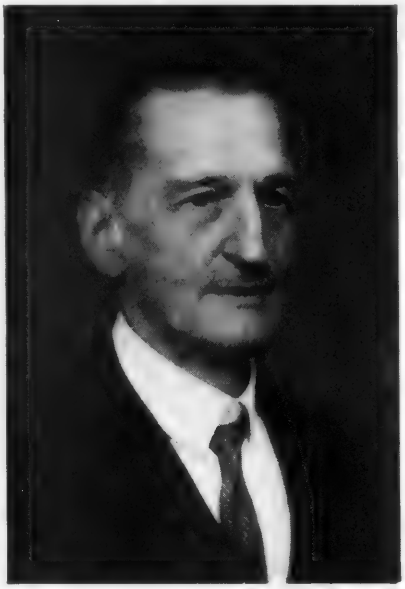
"In general", the report comments, "the numbers of animals were not enough to give statistically conclusive results."

Sesquisilicate of Soda

We have received from Alcock (Peroxide), Ltd., Luton, a small bottle of their Sesquisilicate of Soda. It is a new industrial alkali and is available in pure white crystalline form. It has been introduced as an industrial cleaner, and the company states that one of the largest dairies in the country reports that after extended trials they have decided to adopt Sesquisilicate of Soda, as, in addition to the cost of detergent being reduced by one-half, their bottles are cleaner and brighter. It may be used in any type of washer and is supplied in 1-cwt. iron drums.

Death of Mr. Philip M. Sturge

We regret to record the death of Mr. Philip Maximilian Sturge, joint managing director of Arthur Holden and Sons, Ltd., of Birmingham. He passed away on Tuesday, December 31, in his 67th year, after a brief illness caused by pneumonia.



The late Mr. P. M. Sturge, who was Joint Managing Director of Arthur Holden and Sons, Ltd., of Birmingham.

He was educated first at home and afterwards studied at Lille and Stuttgart, where he acquired a knowledge of French and German and of Continental commercial practice.

On his return to Birmingham he acquired business experience in export trade and later joined Arthur Holden and Sons, and was appointed a director when the business was converted into a private limited liability company. He then became a joint managing director, a position he held at the time of his death.

German Chemical Plant Exhibition

The "Achema VIII." exhibition of chemical plant, organised by the Dechema Deutsche Gesellschaft für chemisches Apparatewesen E.V. (German Chemical Plant Association), will be held in Frankfurt-am-Main early in September, 1937, together with the 50th General Meeting of the Verein Deutscher Chemiker.

Frankfurt-am-Main is not only suitable by reason of its geographical and economic position, but also because it was there that the Verein Deutscher Chemiker was founded in 1887.

Liver Extract, Berne Tests

It has been established that liver extract, as distinct from meat extract, has the property of increasing physical endurance. Result of series of experiments on students in Berne University Physiological Department proves that efficiency of muscular action reached maximum after administration of liver extract. Tests were favourable to this extract both in muscular power increase and in respect of effort endurance. Liver contains an element which may be conveyed by a properly prepared extract and, according to report, this characteristic acts on muscles as a "regulator".

New Wrapping Machine

A new wrapping machine is being manufactured by the Automat Moulding and Folding Co., Toledo, Ohio, U.S.A., which can be used for the purpose of packaging lard in transparent cellulose and is said to also satisfactorily package such products as vegetable or mineral oils. The transparent cellulose is placed on the machine in roll form. The machine automatically forms a transparent bag sealed on the side with liquid adhesive and the bottom closed with a metal seal—a patented exclusive Automat feature. The product is accurately measured and deposited through a tube into the bag. The top is then sealed with the same type of metal seal as the bottom. The filler and sealer are then placed in cartons as they are conveyed through the machine.

If desired, the machine may be equipped with an automatic carton-folding device and also an automatic device for closing the top of the carton after the transparent bag has been deposited into it. It is stated that many sizes of package can be produced on the machine by simple adjustments. The square or rectangular mandrel or tube around which the transparent cellulose container is formed may be changed in a few minutes, thus giving a container of different width or thickness. The length of the container is even more easily changed with a hand wheel. This may be done while the machine is in actual operation.

In the packaging of cooking compound or lard, the bag is made with a single wall of plain transparent cellulose. The machine, however, readily handles the moisture-proof and heat-sealing types. With the regular standard equipment it also produces a double wall transparent cellulose container.

Negretti and Zambra

Mr. Marcus William Zambra, of the firm of Negretti and Zambra, has retired and gone to live at Seal Chart, Kent.

As a result of increasing demand for all types of instruments made by this concern a fourth new extension, consisting mainly of a double-floor building of approximately 10,500 square feet, has now been completed.

The "Queen Mary" and Negretti and Zambra

Negretti and Zambra, 38, Holborn Viaduct, London, received the order for the complete equipment of Dial Thermometers and Pyrometers for the engine and boiler rooms of the *Queen Mary*. The installation comprises 112 mercury-in-steel Dial Thermometers and 24 thermo-electric Pyrometers.

Cocoa Butter

We have received from M.R. Chemical Products, Ltd., 22, Basinghall Street, London, E.C. 2, a sample of "Romos" Deodorised Cocoa Butter, which they are now producing in England. This appears to be a pure, deodorised, and white material, free of taste and odour. The price varies according to quantities from 1s. 3d. per lb. to 1s. 6d. per lb., but large quantities could be supplied cheaper.

(By courtesy of Hayward-Tyler and Co., Ltd., and Henry Wiggin and Co., Ltd.)

Grapefruit Agitator with spindle and propeller both in Monel Metal. This is the reproduction of an illustration in the fourth part of "Food Manufacturing Equipment", the alphabetical reference book concerning the uses of Monel Metal, Nickel and Inconel in the manufacture of foodstuffs, a note on which appeared on page 30 of our January issue.

New Filter

The *Drug and Cosmetic Industry* reports that the Ertel Engineering Co., 120, East 16th Street, New York, is offering a new filter of rather unusual design. This machine is designed to give what might be called a *series* filtration. That is, instead of passing the liquid through individual sheets to the discharge port, this filter gives a progressive filtration by passing the liquid through several sheets. As the liquid comes into the filter it is given a preliminary filtration through paper sheets to remove all the heavier and more flocculent matter before it is forced through the finishing pads, which are made of a special asbestos material. This method is said to reduce filtration costs from 30 to 70 per cent. It is said that this filter, in addition to delivering an unusually bright filtrate, will operate much longer on materials that are difficult to filter because the material that causes clogging is removed by the paper sheets before the liquid reaches the asbestos discs.

Wire-Tying Machine

Cutbill, King and Co., Ltd., 32, St. Mary Axe, London, E.C. 3, have sent us particulars of their Wire-Tying Machine. The steel strapping of boxes, cases, and other packages gives added security. It prevents pilfering in transit, and, at the same time, greatly increases the mechanical strength of the containers so secured.

With this machine the wire can be used direct from a coil, thus avoiding the large percentage of waste crop-ends when cut lengths are used, as well as the attendant saving in labour, handling, storage, etc. The machine is light in weight, and easy to handle, while the number of component parts is reduced to a minimum, with the subsequent elimination of risks of damage, trouble, or breakdown.

It is stated that each tie should not take more than three seconds, while only one turn of the handle is required to complete the tie and cut off the wire.

New Showrooms for United Water Softeners

United Water Softeners, Ltd., makers of the well-known "Permutit" Water Softeners, have opened extensive new showroms at 151, Regent Street, W.1 (their Aldwych House showroom now being closed).

The spacious ground floor, which is decorated and furnished in excellent taste, features their domestic plants of all types and sizes, and expert lady demonstrators are in attendance.

In the large lower ground floor showroom is installed Industrial Water Softening equipment and some of the plants are in section form and others are actually in operation. The Company hope that architects, engineers, etc., will make full use of this section to inspect the most modern methods of water treatment and to obtain information or advice concerning any water problem which may be engaging their attention.

It is evident that United Water Softeners, Ltd., expect the boom in their products to continue, and we wish them all the success which their enterprise deserves.

▼ ▼ ▼

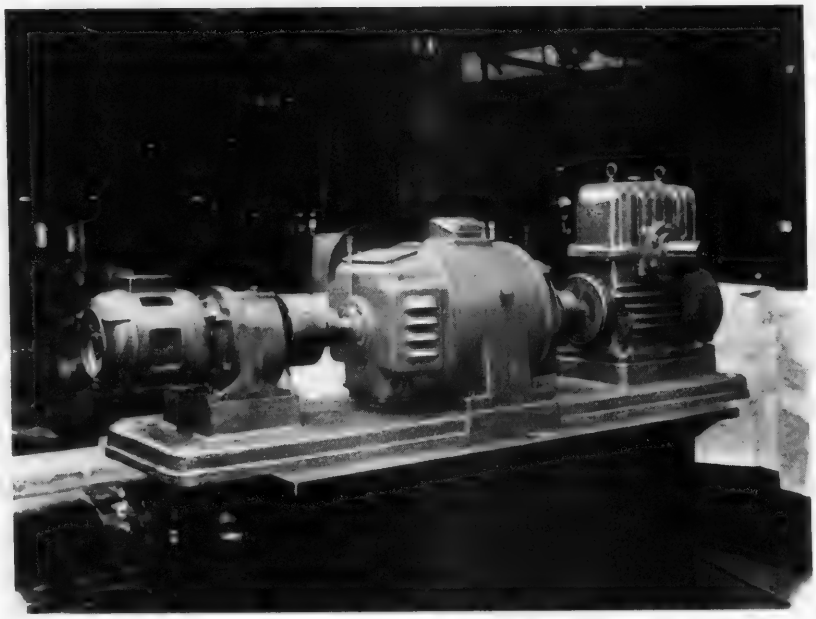
The Double Shell Cap which is a new product of United Glass Bottle Manufacturers Ltd.

Double Shell Metal Caps

Double Shell Metal Caps, which are a combination of an outer and inner shell interlocked to prevent any possibility of slipping, with screw threads on the inner shell, the outer shell presenting a plain round finish, will shortly be manufactured in this country. Patents have been acquired and licenses granted for the Double Shell Cap which will enable manufacture to be commenced immediately by the Metal Box Co., Ltd., through their associate Company Sure Seal and Sutax, Ltd., and the United Glass Bottle Manufacturers, Ltd., through their associate Company Kork-N-Seal, Ltd.

This Double Shell Cap, which of course can be lithographed on the outside in the same way as the ordinary metal cap, and fitted with any required liner, will add a high-class cap to the present range of metal caps already on the market.

The cap has all the advantages of the ordinary screw cap, combined with the plain outer shell, enabling the cap to be lacquered or printed in any combination of colours or designs, making it most attractive in addition to its efficiency as a seal.



(By courtesy of Crofts (Engineers) Ltd., of Bradford).

A Variable Speed Drive for application to machinery with independent constant slow speed drive for inching purposes. The main motor is a variable speed motor driving the machine at any speed between 20 and 61·5 r.p.m.

TRADE LITERATURE RECEIVED

"The Accurate Measurement of Temperature"

The Cambridge Instrument Co., Ltd., 45, Grosvenor Place, London, S.W. 1, have brought out a new publication entitled *The Accurate Measurement of Temperature*. The book cannot be described as a catalogue, for it groups together in a comprehensive form a mass of information regarding methods of temperature measurement.

The first section covers the theory and application and is concise and easily readable. A carefully selected bibliography has been appended for the use of those desiring more detailed information regarding any particular type of temperature measuring equipment. The second section of the book gives comparative data, illustrations, and concise details of all the various types of temperature measuring instruments that are in general use, ranging from the simple mercury-in-glass thermometer up to the optical pyrometer for the measurement of the highest temperatures.

Owing to the high cost of compilation the company are making a small charge of 1s. 6d. for the book in order to cover part of the expense of postage and handling.

Electric Trolley-Hoists

A leaflet sent to us by Herbert Morris, Ltd., Loughborough, England, describes their electric trolley-hoists. These machines are stated to be readily adaptable to the handling of many varied loads. The flexibility of the Morris overhead electric runway system itself and of the travelling units which work on it, is such that most requirements of track layout, hoisting, and travelling speeds and of load container equipment can be economically satisfied.

Saccharimeters

Bausch and Lomb Optical Co., Rochester, N.Y., U.S.A., have sent us a copy of their booklet on Saccharimeters of the Half-Shadow type. The booklet contains a number of illustrations and a diagram showing the path of light through a Half-Shadow Saccharimeter.

The company state that the Saccharimeter is direct reading in the international sugar scale, which is the scale universally accepted. In using the instrument no tables for conversion of scale readings are required. It has a double field and single quartz wedge compensation. Polarisers of two types are offered—namely, the Lippich double prism and the Jellet with fixed half-shade angle. The scale is etched on glass and is read by transmitted light. The instrument is built so as to accommodate tubes up to 400 mm. in length as well as control tubes. It is mounted on a trestle support, to which is attached a bracket supporting the light source.

"Power"

We have received a copy of the booklet *Power*, which has been specially prepared and is issued jointly by the internal combustion engine makers of this country. It is attractively produced, the cover being in black and yellow with the word "Power" printed on an outer cover of transparent material. A number of coloured diagrams are included showing the economy and efficiency of oil engines.

The booklet gives, in an attractive manner, some facts and figures relating to the advantages of the oil engine. Headings of the various sections of the booklet include Economy, Reliability, Proofs, Replacing Old Plant, Direct Oil Engine Drive, Independence and Immunity from Air Attack, and Costs of Running Typical Oil Engine Installations.

The British Thomson-Houston Co. Ltd.

We have received from the British Thomson-Houston Co., Ltd., a copy of their annual article dealing with the developments and important orders obtained by the company during 1935. The report draws attention to the value of research to the electrical industry, and states that the amount of investigational work carried out year after year by firms such as the British Thomson-Houston Co., Ltd., is frequently an indication of the progress of the industry.

After mentioning some of the important developments made, the report then deals with the activities of this company under headings which are themselves an indication of the progressiveness of this well-known concern.

"Converting a Business into a Private Company"

This practical little book published by Jordan and Sons, Ltd., 116, Chancery Lane, London, and which is in its eleventh edition, is full of useful information and answers to questions as to the precise advantages which carrying on a business as a Company possess over personal ownership. It describes step by step the exact procedure which has to be followed from the time the owner of the business has arrived at the decision to form a company until the completion of the transfer of the business to the company.

A typical case is taken and dealt with under such heads as "The Formation of a Company", "Cost of Formation", "Memorandum of Association", "Articles of Association", "Transfer of Business to Company", "Further Documents", and "Obtaining Additional Capital".

Cellophane

British Cellophane, Ltd., 179, Tottenham Court Road, London, W. 1, have sent us a copy of their latest booklet entitled *Are You a Cellophane Fan?* The booklet gives in an amusing way a considerable amount of information regarding the uses of cellophane. Mention is also made of Dr. J. E. Brandenberger, the Swiss chemist, who discovered cellophane, and a short account is given of how it is made.

Autoflex Drives

Weams Autoflex Drives, Ltd., 2, Sloane Terrace, Sloane Square, London, S.W. 1, have sent us a descriptive booklet of their automatically flexible transmission units, which solve the problem of direct drive from high speed electric motors. These drives are stated to reduce power losses, shafting can be to a great extent eliminated, and using one ordinary flat belt the shortest centres are possible with freedom from belt slip, thus enabling the motor to be mounted on, or close up to, the driven machine.

Monel Metal versus Carborundum Powder

Further proof of the inherent resistance of Monel Metal to abrasion and corrosion is given in the latest card issued by Henry Wiggin and Co., Ltd., entitled "Monel Metal *versus* Carborundum Powder".

In the production of carborundum one of the manufacturing processes involves the boiling of carborundum powder in a weak solution of sulphuric and hydrofluoric acids. A valve protected by means of a metal cover is fitted at the bottom of each tank in which the boiling is carried out. When Monel Metal was used the covers lasted longer, as did also the valves, than when they were made of Phosphor Bronze.

Pressure Gauges

A new catalogue has recently been issued by Negretti and Zambra, of 38, Holborn Viaduct, London, E.C. 1, entitled "Pressure, Vacuum, and Contents Gauges". It has a brown, semi-stiff cover and contains 48 pages giving a description of the various instruments covered by this heading, together with a large number of illustrations. The range of instruments includes draught and pressure gauges, vacuum gauges, pressure and vacuum gauges, barovacuum gauges, pressure and vacuum recorders, vacuum records, combined pressure and temperature recorders, contents gauges, etc.

General Chain Leaflet

The Renold and Coventry Chain Co., Ltd., Renold Works, Didsbury, Manchester, have sent us a copy of their illustrated brochure on the advantages of chain drives. These chain drives have been introduced with a resultant saving of power in a large number of industries. A 100 per cent. efficient transmission medium does not exist, but it is stated that these drives deliver over 98½ per cent. of the power paid for, while in addition their efficiency is maintained throughout their long life.

The brochure is very well produced and consists of a large number of illustrations showing these chain drives in application under varying circumstances and in different industries. The photographs include chain drives working on sugar coating pans, an ammonia compressor, a cement grinding mill, etc.

The "Monopak" self-printing tape machine.

"Monopak"

The "Monopak" is a Self-Printing Tape Machine; the gummed strip being used in preference to string for sealing parcels, cases, or boxes. We have received from Le Vane's Patents, Ltd., Chesham House, 150, Regent Street, London, W. 1, a brochure dealing with this machine.

It is claimed that the machine will print, damp, cut off any required length of tape, and seal the parcel in one operation. In addition, the tape can be printed with your name, slogan, trade-mark, or advertising matter, and in addition the printing on the tape can be changed every day, if required, at the cost of a few shillings. The machine is soundly constructed in a small steel cabinet finished in black and nickel plate.

Second-Hand Power Plant

George Cohen, Sons and Co., Ltd., 600, Commercial Road, London, E. 14, have issued a catalogue showing the modern second-hand Power Plant which they have in stock at their various depôts. A large selection is available and prices are, of course, well below those of new plant.

Owing to increased business George Cohen, Sons and Co., Ltd., have built new showrooms for their second-hand machinery department at Wood Lane, Shepherd's Bush, London, W. 12. From this address the machinery business in London and Southern England will in future be conducted. Customers who have been in the habit of writing on machinery matters to 600, Commercial Road, London, E. 14, are requested to write in future to Wood Lane, Shepherd's Bush, London, W. 12.

"Chemicals by Glyco"

The latest edition of this interesting catalogue has just been published. Several new products which were on display at the recent Chemical Exposition in the United States are fully described. Amongst these might be mentioned Diglycol Laurate; Abopon; Proofit, a one-bath waterproofing agent; Lohrinol, a wetting agent especially suitable in acids and hard water.

A welcome addition to the Chemical and Physical tables has been the inclusion of *p*H tables of the most common acids and bases.

The Glyco Products Co., Inc., 949, Broadway, New York, N.Y., will be glad to send a copy to any executive, chemist, or technical worker on request.

Wright, Bindley and Gell, Ltd.

We have received from Wright, Bindley and Gell, Ltd., Percy Road, Greet, Birmingham, a copy of their catalogue of Metal Containers and Closures.

The catalogue has been tastefully produced, and contains a number of excellent illustrations of the company's products as well as useful diagrams. Some of the illustrations are of slip-on caps, screw caps, circular containers, tablet containers, shaving soap and brush cases, rectangular containers, etc.

In addition to metal containers and closures, the company makes Small Cold Stampings for all branches of the Engineering Trades and Pressings in all kinds of metal for Cycle, Electrical, and Automobile manufacturers.

INFORMATION and ADVICE

Self-Raising Flour—Crustless Cheese—Composition of Fish—Walnuts—Bearded Beetroot—Tomato Sauce

Self-Raising Flour

1,971. *May we venture to ask your opinion as to the practicability of our attempting to manufacture our own flour for use in making self-raising flour, this being an alternative to buying flour from the mills? The quantity required would be rather small.* (Yorkshire.)

There is no doubt that unless you are prepared to launch out in a big way and have plenty of capital at your disposal it would be folly to attempt to do your own milling. This is a miller's job, and, of course, in order to make a success of it considerable experience is required. It is another matter if you have sufficient capital with which to command the services of experienced labour, to say nothing of the plant required.

Crustless Cheese

1,972. *In reading your magazine we noticed an advertisement for a machine for the manufacture of crustless cheese. We have already written to the manufacturers' representative in London, and are writing this letter to ask you if you would be kind enough to forward us whatever information you can on just what type of cheese this is and the manufacturing process regarding same.*

We understand at present that this is a Cheddar cheese, but we are unfamiliar with the manufacturing process as we cannot find any similar item in the United States. Whatever information you can give us will be appreciated. (U.S.A.)

You are probably confused over the term "crustless" cheese. Another term which is probably familiar to you is "processed" cheese. The raw material used is not confined to Cheddar. It is a question of blending types found suitable by experience and on a basis of price. Essentially the process is one of grinding, melting, emulsification (with the aid of a suitable emulsifying agent), casting into the form required, and wrapping. You are doubtless quite familiar with the details of this processing.

Composition of Fish

1,973. *On referring to Section 8, "The Composition of Foods," in* Food Industries Manual, *for the approximate and average composition of certain fish, we find that* no figures for moisture are given *and* no statement made as to how the proteins are calculated, *whether on the dry fish or on the sample as analysed, in which case* moisture should be included.

We are anxious to obtain average figures for the following fish, and should be glad if you can let us have any available, as they are required in connection with some research we are undertaking.

Figures are required for fat, protein, moisture, and ash, on salmon, shrimp, lobster, crab, bloater, anchovy, herring—all to be on the cooked fish. (Wales.)

You will find all the information you require in Hutchinson and Mottram's book *Food and the Principles of Dietetics*. Tables of analyses of cooked fish are given, and they are probably more, or at least as reliable as any that have been published.

Walnuts

1,974. *We are anxious to acquire information on the following points concerning the preservation of walnuts when removed from their shells:*

1. *How to keep walnut kernels removed from shells free from rancidity.*

2. *How to keep ground walnut kernels, and also ground almonds, free from rancidity.*

3. *Any information with regard to the improved methods of cracking and general handling.*

We think that you will probably be in touch with any work which has been done on these points, and we should be extremely grateful for any information you may be able to give us.

We should also appreciate references to any literature dealing with the subject.

We must apologise for troubling you, but the subject is of considerable interest to us. (England.)

We are not clear if this includes the brining and pickling of walnuts, a matter on which we could, of course, supply information. If not, one would imagine that the methods used in connection with the blanching of almonds and the preparation of marzipan would give some pointers. The same applies to peanuts and peanut butter. We can supply information on these matters if required.

Mr. J. Hamond, of the East Malling Research Station, has studied the question of the preservation of walnuts and kindred questions, and he has published several papers in the Annual Reports of the Station. These should be consulted. We have reviewed them in previous issues of this journal. Another source of information is *Bulletin* No. 227, by E. H. Wiegand, entitled, "Walnut Drying and Packing in Oregon," and issued by the Oregon State Agricultural College Experiment Station.

Bearded Beetroot

1,975. *We thank you for your letter of the 12th inst., with recipe for prepared mustard, and note that you will write us later re beetroot in red currant jelly.*

Regarding the prepared mustard, some time ago we bought a jar of this, and it has been lying on the writer's desk for well over a month now, uncapped, and shows no sign of going hard. This, we are informed, is due to a tasteless edible oil which has been used in the make-up. Can you recommend an oil which would be suitable for this purpose?

With reference to the beetroot, the writer bought a jar of this, packed by a well-known London firm, a few weeks ago, for experimental purposes. After standing for less than a fortnight, the beetroot on the top was covered with a greeny white beard. In the meantime, we had filled one or two jars by the simple process of pouring the hot jelly over the beet. These were handed to friends for their approval, and the replies received have been very favourable indeed. Only one complaint has been received, that after the jar had been open for about a fortnight the beet on top began to grow a beard. In this case, the "bearded" beet was taken out, cleaned and—eaten! And the delving into the jar was continued at an even faster rate than before. When looking into the matter, would it be possible to find a cure for this growing of beards? (Scotland.)

The best oil to use for plain mustard is cotton seed oil, which should be well mixed in with the mustard before any other ingredients are added.

With regard to fungi on beetroot, this is due to too high a water content. When the beetroots are casked, they should be allowed to dry before peeling, which operation should be done on a dry table. Knives and hands should be perfectly dry, and after peeling all moisture should be rigidly excluded from the beetroot. A little salt in the water used for soaking will help.

Tomato Sauce

1,976. *A reader gives particulars of his process for preparing tomato sauce. Very briefly, the tomatoes gathered during the season are boiled and sealed in 4-gal. tins, which are used during the remainder of the year. The pulp is cooked in pans, run through a pulping machine, bottled, and sterilised. He wishes to know something about other, and more up-to-date, methods which are in use. I understand the vacuum method is largely used in America.* (England.)

This is a big subject to deal with in ordinary correspondence. We have published fairly complete articles on the subject in previous issues. You should refer to these. Also you should get into touch with the suppliers of plant (names were furnished).

Your friends are certainly using a somewhat primitive process. We know that methods vary considerably according to locality and circumstances, but in general one can state that after carefully selecting the tomatoes with due regard to soundness and freedom from mould, and also on a basis of flavour, colour, etc., they are washed and then passed along a sorting belt where a further selection is made. They are then trimmed and passed through a scalder.

The scalding is done by exposing the tomatoes on a woven wire belt to the action of jets of steam for a minute or so to loosen the skin, after which they go through what is known in America as a Cyclone, which is really a pulping machine such as you mention. The materials then go into an evaporator, which is preferably glass lined, fitted with a specially designed copper coil carrying 100 to 120 lb. steam pressure in order to obtain rapid evaporation. These coils will reduce about 700 gallons of juice to one-half of its original volume in 20 to 30 minutes.

Evaporation under vacuum is seldom used in the United States. Apparently the longer time required for evaporation and the greater complexity of the equipment outweigh the benefits obtained from improved colour and flavour due to lower temperature on evaporation.

After evaporation the pulp is passed through a finisher, which may be cylindrical or conical in shape with paddles or brushes to beat the pulp through a fine screen and remove any particles of skin, seeds, etc.

The pulp is then immediately filled into cans, and if the filling temperature is above 180° F. no processing is necessary. Syrupers as used in fruit canning are commonly used for filling the pulp. Usually plain No. 10 tins holding about 6¼ lb. are used, but often 5-gal. cans lacquered inside with soldered caps are employed. Cooling of these large containers is essential and storage conditions must be watched. Properly prepared purée will keep almost indefinitely.

As regards actual sauce making, the ingredients, of course, vary greatly depending on various circumstances. The principal ingredients, apart from tomatoes, might be vinegar, salt, sugar, onions, garlic, and spices. Naturally, the details of preparation vary with the ingredients to some extent.

When the boiling is finished, the sauce is passed through a finishing machine similar to a Cyclone but with finer perforations in the screen, and is collected in a holding tank before filling into bottles.

In some instances a shaking screen is used instead of a finisher, as it is claimed that this produces less breaking up of the fibres, thereby producing a better consistency and results in less inclusion of air in the finished product. Brush finishers with conical screens are also used in place of the ordinary cylindrical paddle finishers.

High-speed rotary filling machines are used in which the sauce is filled at the rate of 100 bottles per minute. Pasteurisation of the sauce is not necessary if the filling temperature is 175° F. or higher. Rapid cooling of the filled bottles is desirable in order to retain the colour and flavour as far as possible.

Correspondence on Herring Life Cycle

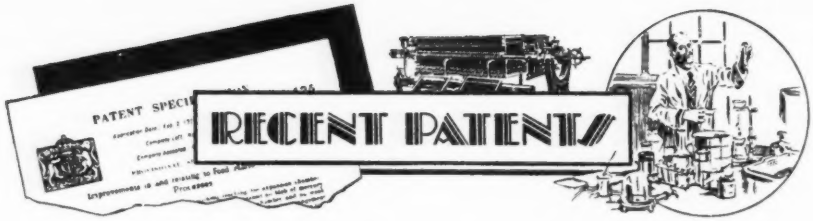
To the Editor of FOOD MANUFACTURE, *from the Ministry of Agriculture and Fisheries (Eastern Area)*:

My attention has been called to a misunderstanding given rise to by my remarks at the National Food Canning Council Conference at Cardiff.

I drew attention to the cycle in the yearly life of the herring, which is well known to experts. From this time of the year, January, until early spring most British herrings are in poor condition. This fact has been recognised by the Herring Industries Board, which is prohibiting the kippering or processing of herrings from April 14 to May 13.

The rich feeding of the fish in early summer causes a rapid accumulation of fat in the fish; later the roe develops, and the fat diminishes, until finally the fish spawn and are out of condition. But this cycle of events affects herrings in different parts at different times, as with the ripening of fruit, and it would have been quite erroneous on my part to have suggested that herrings are only in their best condition during the famous Yarmouth season.

GEORGE T. ATKINSON
(*District Inspector of Fisheries*).



These particulars of New Patents of interest to readers have been selected from the "Official Journal of Patents", and are published by permission of the Controller of H.M. Stationery Office. The "Official Journal of Patents" can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

Latest Patent Applications

540. CADE, A. F. (BAKER): Apparatus for pulping fruit, etc. January 7.
32972. AMERICAN CAN CO.: Method of packaging milk. November 28. (United States, June 25.)
33351. KRAFT-PHENIX CHEESE CORPORATION: Treatment of cheese. December 2.
33654. NAAMLOOZE VENNOOTSCHAP INDUSTRIEELE MAATSCHAPPIJ VOORHEEN NOURY AND VAN DER LANDE: Manufacture, etc., of flour. December 4. (Germany, December 4, 1934.)
33814. STÄGER, A.: Manufacture of seasoning preparation. December 6. (Switzerland, December 7, 1934.)
34386. DIXON, T. R.: Manufacture of yeast. December 11.
34491. DIXON, T. R.: Manufacture of yeast. December 12.
34508. MARAKAS, J.: Refining of sugar. December 12.
34688. BEAN MAY PROCESS CORPORATION: Method of intensifying fruit, etc., juice. December 13.
34901. SCHLAEPFER, A., and SCHWEIZERISCHE INDUSTRIE-GES.: Machine for wrapping ice-cream, etc., in paper. December 16.
34965. DOYLE, J. D., and DOYLE, M. K.: Preservation of milk, etc., products. December 17.
35014. PLEWS, W. J.: Method for explosive treatment of cereals. December 17.
35015. PLEWS, W. J.: Apparatus for the explosive treatment of materials. December 17.
35130. LEONHARDT, R.: Manufacture of accessory baking agents. December 18.
35290. FLODQUIST, L.: Production of liquors, etc., containing vitamins. December 20.
35338. MONTMARTIN, G.: Apparatus for smoking food products. December 20.
35480. FISADCO, LTD., KRAMP, J. H. F.: Fish-dressing machines. December 21.
35590. STALEY MANUFACTURING CO., A. E.: Production of soya beans for consumption. December 23.
35709. COOK, H. M.: Apparatus for cleaning fish. December 24.
35820. MARIN, A. S.: Packages for holding lemons, etc., for transport. December 27.
36032. CROSLAND, E. M., VICARS, LTD., T. AND T.: Biscuit-making, etc., machines. December 31.

Complete Specifications Accepted

439,020. UNITED DRUG CO.: Cough-drop and process of making it.
439,122. SOKAL, S. (DEUTSCHE PENTOSIN-WERKE GES.): Food for poultry.
439,141. DEUTSCHE STAERKE-VERKAUFS-GEN. EINGETRAGENE GEN.: Manufacture of sweetstuffs.
439,246. CLASSEY, L., and APLIN AND BARRETT, LTD.: Cheese preparations.
439,564. VICARS, LTD., T. AND T., and CROSLAND, E. M.: Treatment of dough in the manufacture of biscuits and the like.
439,595. MOLASKA CORPORATION: Spray-drying of molasses and other viscous foodstuffs.
439,603. ALUMINIUMWERK TSCHEULIN GES. and CRAEMER, K.: Packing material for perishable goods.
439,617. TYBERGHEIN, E. C. E., and BACKER, P. J. DE: Manufacture of coffee free from caffeine.
439,727. STEVENS, A. H. (NATIONAL BISCUIT CO.): Panning of articles.
439,738. ROSE, A. G., and ROSE BROS. (GAINSBOROUGH), LTD.: Mechanism for feeding and cutting a bar of plastic toffee or like material.
439,742. MAIN, J. A.: Tea-withering.
439,746. RAW PRODUCTS, LTD., and DUTTWEILER, B.: Cheese manufacture. (Addition to 404,850.)
439,784. FREUDENBERG, GES., C.: Method of improving gelatine.
439,886. CALDWELL, W. J.: Press for use in conjunction with a container for meat and other foodstuffs.
439,952. MAIN, J. A.: Controlled withering of tea.
440,145. HOBART MANUFACTURING CO.: Method of and apparatus for aerating a liquid such as cream.

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

Abstracts of Recent Specifications

Group Abridgments can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, either sheet by sheet as issued on payment of a subscription of 5s. per Group Volume, or in bound volumes price 2s. each.

430,004. GROUP XVIII. **Weighing apparatus.** WALKDEN, W., WESTAWAY, AND TRUSLOVE, W., Newlands, both in Mayfield, Sussex.
A weighing or egg, etc., grading appliance comprises a weighing beam or lever and a float or buoyant member rigidly connected thereto and disposed in oil, water, or other liquid, the weighing beam also having an arm associated with a pointer and scale for indicating the weight or grade of the egg or other article. The scale pan is situated directly over the float. The weighing beam is provided with an adjustable counter-balance weight, and its movements are limited by stops or by a slot in an upwardly projecting arm carrying the indicating scale. The movements of the beam are damped by a perforated member surrounding the float within the liquid container.

435,272. **Stable flavouring emulsion.** ROYAL BAKING POWDER CO., 595, Madison Avenue, New York, U.S.A.
With the object of preparing flavouring emulsions in which the essential oil does not decompose or volatilise after a relatively short time, it is proposed to incorporate a volatility reducer and a hygroscopic ingredient to prevent rupture of the emulsoid. Any water-insoluble edible organic compound with a boiling point above that of the essential oil used for the flavour, and which does not modify the flavour, may be used as the volatility reducer. They include high boiling alcohols (octyl, nonyl) and high boiling esters (methyl, ethyl, propyl esters of tartaric, citric, succinic acids). Example: 0·6 part gelatine in powder or granular form is dissolved in 7 parts water and the solution mixed with 7 parts invert sugar and a mixture of about 3·4 parts lime oil and 1·5 parts ethyl succinate. After emulsification in the usual manner the emulsion can be directly added to a dessert mixture. Alternatively, the emulsion may be converted to the dry form by vacuum or spray drying, but preferably by adding an edible dehydrating carbohydrate such as anhydrous corn sugar. (Convention date, U.S.A., March 24, 1933.)

435,522. **Food for animals.** RAU GES., 109, Lutzowstrasse, Berlin.
Lupin seeds of high oil content, either those of the species *Lupinus mutabilis* or *Lupinus Cruikshanksii* or seeds of these or other species, the oil content of which has been increased by selective cultivation, are used as a source of oils or fats, and the residues after extraction of oils by pressure or solvents are used as human or animal food. Preferably sporadically occurring seeds of low alkaloid content are cultivated.

435,978. **Treating wheat, etc., germs.** WILLE, K., 3, Kaiserberg, and FRITSCH, E., 53, Nahestrasse, both in Duisburg, Germany.
Wheat or rye germs are freed from oil and treated first for one day at 30° C. and then for several days at room temperature with yeast and lactic acid, the product is mixed with fresh germs and fermented again with yeast for several hours, further germs and yeast are then added and the product again fermented, after which it is worked up into baked goods. The germs may be made into a dough with water and the yeast, and the lactic acid with diastase and soluble starch added and the fermentation effected. The second fermentation may be at 30° C. for 5 hours, the dough being beaten as frequently as possible, and sodium chloride may be incorporated therein besides the additional germs and yeast. The third fermentation may be for 30 to 50 minutes.

(*Continued on page 77.*)

RECENT TRADE MARKS

This list of Trade Marks of interest to readers has been selected from the "Official Trade Marks Journal", and is published by permission of the Controller of H.M. Stationery Office. The "Trade Marks Journal" can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

ALBATROSS.—564,692. **Lard compounds for use as ingredients in foodstuffs.** G. W. MARSDEN, LTD., Firth Street, Huddersfield. December 27.

BRISK.—562,736. **Sausage binders, being dried crushed bread or biscuits with or without spice.** W. J. BROOKS AND SONS, LTD., Skerton Road, Old Trafford, Manchester. January 15. (By Consent.)

COVO.—564,480. **Edible oils and edible fats.** COVO REFINING COMPANY, LTD., Unilever House, Blackfriars, London, E.C. 4. January 8. (By Consent.)

DIASOY.—565,089. **Flour and food preparations, all made from soya beans.** SOYA FOODS, LTD., Springwell Lane, Rickmansworth, Hertfordshire. January 15.

DRINKS OF HEALTH. — B 557,348. **Cordials (not alcoholic).** ROBERT SMITH, trading as T. and R. Smith, Wellington Mineral Water Works, Congress Street, Chorley, Lancashire. January 2.

User claimed from December 1, 1904.

The applicant undertakes that this mark, when registered, and the Mark No. 557,349 (2977) xliv, shall be assigned or transmitted only as a whole and not separately.

FOUR KINGS.—565,193. **Substances used as food or as ingredients in food.** HUBERT WATERS, 296, Bute Street, Cardiff. January 15.

GOLDEN GLOW. — 562,395. **Butter.** DOBSON'S DAIRIES, LTD., Lloyd Road, Levenshulme, Manchester. January 8. (By Consent.)

GOLDEN HILL.—564,055. **Butter, cheese, and milk.** THE BROUGHTON DAIRIES AND CREAMERIES (MANCHESTER), LTD., 115, Broughton Lane, Manchester, 7. December 27.

GOLDEN STAR.—563,932. **Canned pineapple.** GEORGE HARKER AND CO., LTD., 64, Park Street, Southwark, London, S.E. 1. December 27.

Registration No. 507,159 (2704) will be cancelled if and before the applicants' mark is registered.

GOODWOOD CUP.—564,773. **Substances used as food or as ingredients in food.** THOMAS J. SMITH, LTD., 2 and 3, Philpot Lane, London, E.C. 3. December 27.

Registration of this trade mark shall give no right to the exclusive use of the word "Goodwood".

HEATHER. — 564,158. **Bacon.** W. H. TUTTON AND CO., LTD., 14, Fennel Street, Manchester, 4. January 8.

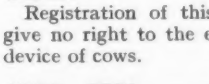
Registration No. 330,271 (1717) will be cancelled if and before the applicants' mark is registered.

HOMESTEAD.—556,850. **Butter for sale within an area having a radius of fifty miles from the Council House, Birmingham.** BROWN, HOPWWOD AND GILBERT, LTD., St. Mary's Buildings, Lench Street and Vesey Street, Birmingham. January 8. (Associated.) (By Consent.)

User claimed from June 16, 1911, Section 21.

Registration of this trade mark shall give no right to the exclusive use of the device of cows.

JOHN PEEL. — 563,668. **Sweetmeats, chocolate, and potted meats in glass containers.** CARRICK'S (CATERERS), LTD., 47, Grey Street, Newcastle-upon-Tyne. January 8. (Associated.)



Confectionery and potted meats in glass containers, and goods of a like kind thereto, will be struck out from the goods of Registration No. 380,748 (2079) if and before the applicants' mark is registered.

MERCURY. — 564,454. **Canned meats, dripping (for food), and butter.** HAMILTON MORTON HOWARD SLEIGH, trading as H. C. Sleigh, 584, Little Collins Street, Melbourne, Australia. January 15.

SOU'WESTER. — 564,131. **Canned fish, canned meats, canned vegetables, and dried fruits.** THOMAS J. SMITH, LTD., 2 and 3, Philpot Lane, London, E.C. 3. January 8. (By Consent.)

SPRY.—564,933. **Edible oils and edible fats.** R. S. HUDSON, LTD., Unilever House, Blackfriars, London, E.C. 4. January 15.

Registration No. 532,968 (2835) will be cancelled if and before the applicants' mark is registered.

SUSSA.—563,867. **Canned fruits and dried fruits.** The firm trading as A. C. FINCKEN AND CO., 197, Great Portland Street, London, W. 1. January 15.

TEXONY.—564,900. **Edible fats.** THE CRIMONY COMPANY, LTD., 183, Heath Road, Twickenham, Middlesex. January 2.

TWO TREES.—563,436. **Condensed and evaporated milk.** COW AND GATE, LTD., Cow and Gate House, Stoke Road, Guildford, Surrey. January 15. (Associated.)

Registration of this trade mark shall give no right to the exclusive use of the device of a cow.

YOSA.—561,078. **Flour and yeast food.** CALLOW BROTHERS, LTD., 69, Bute Street, Liverpool, and 7, Watmough Street, Liverpool. December 27. (Associated.)

Registration of this trade mark shall give no right to the exclusive use of the device of a soya plant.

556,393.—**Oranges and mandarins.** JUAN BAUTISTA MESADO ESTEVE, trading as Bautista Mesado Hijo, Mayor, 7, Carcer, Province of Valencia, Spain, and Bagastro Orihuela, Province of Alicante, Spain. January 2.

RECENT PATENTS

(Continued from page 76.)

437,492. **Meat protein food preparations.** CHAPPEL BROTHERS, INC., City of Rockford, Illinois, U.S.A.

A process is described for separating pure meat protein from the connective tissue. It is asserted that the indigestibility of beef, lamb, and other meats to many people is due to the indigestibility in the stomach of the difficultly peptonised connective tissue which passes unchanged into the intestine and there brings about development of gases and toxins. The process involves water-extraction of comminuted meat, attrition grinding of the extracted meat in presence of water, separation of the substantially unground connective tissue, and recovery of the resulting finely divided meat product.

Various methods are proposed for preparing food products from the resulting protein slush. It may be homogenised in admixture with about the same volume of milk and the mixture spray-dried in an ordinary milk drying plant. Or it may be mixed with whipped or beaten whole eggs or whites of eggs and the mixture likewise spray-dried. An attractive product is also obtained by spraying the mixture of protein slush with milk and egg or chocolate.

NEW COMPANIES

Betts Hartley and Company, Limited. To carry on the bus. of mchts. of tea, coffee, cocoa, etc. Nom. Cap.: £15,000. Dirs.: J. H. Hartley, Windyridge, Elstree; W. Betts, Roselawn, Holwood Park Avenue, Farnborough; G. A. Huett, 23, Bushwood, Leytonstone; E. Tompkins, Woodlands, Chelsfield, Kent.

B. H. Ellis and Sons, Limited. 12, Orwell Place, Ipswich. To take over the bus. of a wholesale fruit and potato mcht. cd. on by B. H. Ellis at Ipswich. Nom. Cap.: £8,000. Dirs.: B. H. Ellis, 12, Orwell Place, Ipswich (permt. gov. dir.); H. S. Ellis, 5, Oxford Road, Ipswich; L. Ellis, Rendham Road, Saxmundham, Suffolk.

Catfield Farm, Limited. Catfield, Norfolk. To carry on the bus. of farmers, dairymen, etc. Nom. Cap.: £10,000. Dirs.: H. P. E. Neave, Bleak House, Catfield, Norfolk; W. Mixer, The Green, Stalham, Norfolk.

C. H. Hoult, Limited. To take over the bus. of a baker and confectioner cd. on at 7, The Crescent, Selby, Yorks, as "C. H. Hoult". Nom. Cap.: £4,000. Permt. Dirs.: C. H. Hoult, 7, The Crescent, Selby (ch.); Mrs. D. Hoult, 7, The Crescent, Selby.

C. J. Stewart, Limited. 38, Holborn Viaduct, E.C. 1. To carry on the bus. of buyers and sellers of meat and provisions, etc. Nom. Cap.: £3,000 Dirs.: Mrs. L. J. Stewart, 16, Langside Avenue, Putney, S.W. 15 (permt. dir. and ch.); R. E. Stewart and Miss R. G. Stewart, both of Langside Avenue, Putney, S.W. 15.

Colroc Biscuit Company, Limited. 87, Great Ancoats Street, Manchester. To take over the bus. of biscuit makers, grocers, etc., cd. on by Colaluca and Rocca, Ltd., at Manchester. Nom. Cap.: £7,000. Dirs.: J. Rocca, Woods Way Bungalow, Manchester New Road, Alkington; N. Rocca, 17, Horncastle Road, Moston, Manchester.

D. J. Davis and Hammond, Limited. To carry on the bus. of brewers, distillers, etc. Nom. Cap.: £50,000. Dirs.: To be appointed by the subs. Subs.: W. J. Bruton, 39, Whatman Road, S.E. 23 (accnt.); J. F. Lightfoot, 243, Scott Ellis Gardens, Grove End Road, St. John's Wood, N.W. (clk.).

Don Dairies, Limited. To carry on the bus. of producers and mnfrs. of and dlrs. in milk, cream, butter, etc. Nom. Cap.: £500. Dirs.: C. D. Barlow, address not stated; T. H. Horne, Cliffthorpe, The Cliffs, Heysham; W. Walsh, 35, High Street, Oswaldtwistle.

E. C. Smith and Co. (Croydon), Limited. 8, Pollards Hill North, Norbury, S.W. 16. To take over the bus. of E. C. Smith and Co., crumpet mnfrs., cd. on at Aero Crumpet Works, Purley Way, Croydon, Surrey. Nom. Cap.: £1,000. Dirs.: E. T. Crofts and Miss N. E. I. Crofts, 8, Pollards Hill North, S.W. 16.

Edward Atkinson, Limited. 2, Station Road, Consett, Co. Durham. To take over the bus. of a wholesale fruit and potato mcht. cd. on by E. Atkinson at Consett and elsewhere. Nom. Cap.: £2,000. Dirs.: E. Atkinson, Whitburn House, Consett, Co. Durham (permt.); J. Atkinson, Whitburn House, Consett, Co. Durham.

Evan Evans Bevan, Limited. To carry on the bus. of brewers and maltsers, etc. Nom. Cap.: £33,000. Subs.: L. E. Peppiatt (solr.) and D. L. Pollock, both of 31, Old Jewry, E.C.

Goodways Cakes, Limited. 33, Great Charles Street, Birmingham. To carry on the bus. of wholesale cake mnfrs., etc. Nom. Cap.: £1,000. Dirs.: W. E. S. Salt, 39, Oakham Road, Harborne, Birmingham; B. C. Kirk, 88, Bristol Road, Selly Oak, Birmingham.

Holloway's (Baby Biscuits), Limited. 456, Dudley Road, Birmingham. To take over the bus. of bakers, confectioners, biscuit makers, etc., cd. on by the executors of the late J. M. Holloway at Birmingham. Nom. Cap.: £1,000. Dirs.: J. G. Holloway, 456, Dudley Road, Birmingham; B. M. Holloway, 19, High Street, Smethwick; H. M. Holloway, 48, Shireland Road, Smethwick.

J. Bradbury and Sons, Limited. To carry on the bus. of pork butchers, etc. Nom. Cap.: £10,000. Permt. dirs.: J. Bradbury, address not stated; F. Bradbury, 16, Weetwood Road, Headingley, Leeds; R. Bradbury, Ker Muir, West Parade, Headingley, Leeds; W. Bradbury, address not stated.

John Harrington and Son, Limited. Folly Wharf, Hertford. To take over the bus. of maltsters cd. on at Hertford and Ware, Herts, and elsewhere as "John Harrington and Son". Nom. Cap.: £30,000. Dirs.: H. S. Rogerson, address not stated (ch.); S. W. Harrington, address not stated. Subs.: H. R. S. Brown, 4, Manor Way, Colindale, N.W. 9 (C.A.); K. C. Pearce, 73, Sidcup Hill, Sidcup, Kent. (C.A.).

Lushus Foods, Limited. 9, Queen Victoria Street, E.C. 4. To carry on the bus. of mnfrs. of and dlrs. in foodstuffs, etc. Nom. Cap.: £10,000. Dirs.: W. M. Shirriff, 58, Heath Street East, Toronto, Canada; F. W. Shirriff, 47, Oriole Gardens, Toronto, Canada; C. H. Shirriff, 33, Hudson Drive, Toronto; G. E. Havinden, 43, Cavendish Road, N.W. 6; R. W. Whittington, 84, Dalmeny Avenue, S.W. 16.

M. Horwitz, Limited. 9-11, Bell Lane, Spitalfields, E. 1. To carry on the bus. of mnfg., wholesale and retail confectioners, etc. Nom. Cap.: £1,000. Dirs.: M. Horwitz, 22, St. Mary's Terrace, W. 2; Mrs. R. Horwitz, 22, St. Mary's Terrace, W. 2.

Mushroom and Fruitgrowers' Association, Limited. 33, King Street, Covent Garden, W.C. 2. To carry on the bus. of agriculturists, growers, and cultivators of vegetables, fruit, etc. Nom. Cap.: £10,000. Dirs.: To be appointed by the subs. Qual. of dirs.: One share. Remun. of dirs.: As voted by the company. Subs.: A. H. Watts (clk.) and P. E. Vincent, both of 27, Lincoln's Inn Fields, W.C. 2.

Norman Foods, Limited. To carry on the bus. of cooked and potted meat mnfrs., etc. Nom. Cap.: £5,000. Dirs.: W. N. Jones, M.A., B.Sc. (permt. mng. dir. and ch.), and J. V. Jones, both of Stoep House, Hooton Park, Wirral, Ches., and H. Lever, 145, Raeburn Avenue, Eastham, Ches.

Perranporth Pavilion, Limited. 70a, Basinghall Street, E.C. To acquire the Perranporth Business House and the Stork Café, Perranporth, Cornwall, and to carry on the bus. of refreshment contractors, etc. Nom. Cap.: £20,000. Dirs.: R. H. S. Ashton, 100, Humber Road, Blackheath, S.E.; J. R. Avery, Trega, Bolingey, Perranporth; J. F. Healey, The Red House, Perranporth; R. J. Trebelco, Bisterne Lodge, Bisterne Avenue, Walthamstow.

Rutland Arms Hotel, Limited. To carry on the bus. of hotel-keepers, etc. Nom. Cap.: £3,000. Dirs.: E. Wood (permt. dir. and ch.) and Mrs. E Wood, both of Rutland Arms Hotel, Bakewell, Derby.

Sweetways, Limited. 14, Odeon Parade, Greenford, Middlesex. To carry on the bus. of mnfrs. of and dlrs. in confectionery, etc. Nom. Cap.: £2,000. Permt. dirs.: F. J. Lovelock, 8, Grosvenor Avenue, N. Harrow (mng. dir.), and R. H. Fancourt, 31, Wood Grange Avenue, Kenton (ch.).

Wallers (Cakes), Limited. 74, Aigburth Road, Liverpool, 17. To carry on the bus. of mnfg. confectioners, etc. Nom. Cap.: £5,000. Dirs.: T. E. Waller and Mrs. M. A. Waller, both of Laughton, Cressington Park, Liverpool. Qual. of dirs.: £1.

Weston Biscuit Company (Belfast), Limited. To acquire the goodwill of the bus. of Stewart's Cash Stores, Ltd., so far as it relates to the mnfr. and sale of biscuits, etc. Nom. Cap.: £35,000. Dirs.: W. G. Weston, S. Hodkinson, W. McLennan, and R. W. Parker, addresses not stated. Subs.: G. J. Withington, The Gables, Francis Road, Stechford, Birmingham (accnt.); and H. C. Chambers, Kerri, Blakesley Road, Yardley, Birmingham (clk.).

W. Reeves and Co., Limited. To take over the bus. of sellers of and dlrs. in brewers' utensils, etc., cd. on at 26, The Minories, E.C., as "W. Reeves and Co." Nom. Cap.: £1,000. Dirs.: G. H. Zeal, H. H. Zeal, and R. O. Zeal, addresses not stated. Subs.: A. G. Maby (solr.) and R. W. Jackling, both of 5, Thavies Inn, E.C. 1.

The above-mentioned particulars of new companies recently registered have been extracted from the daily register of Messrs. Jordan and Sons, Ltd., company registration agents, Chancery Lane, W.C. 2.